

MACWORLD

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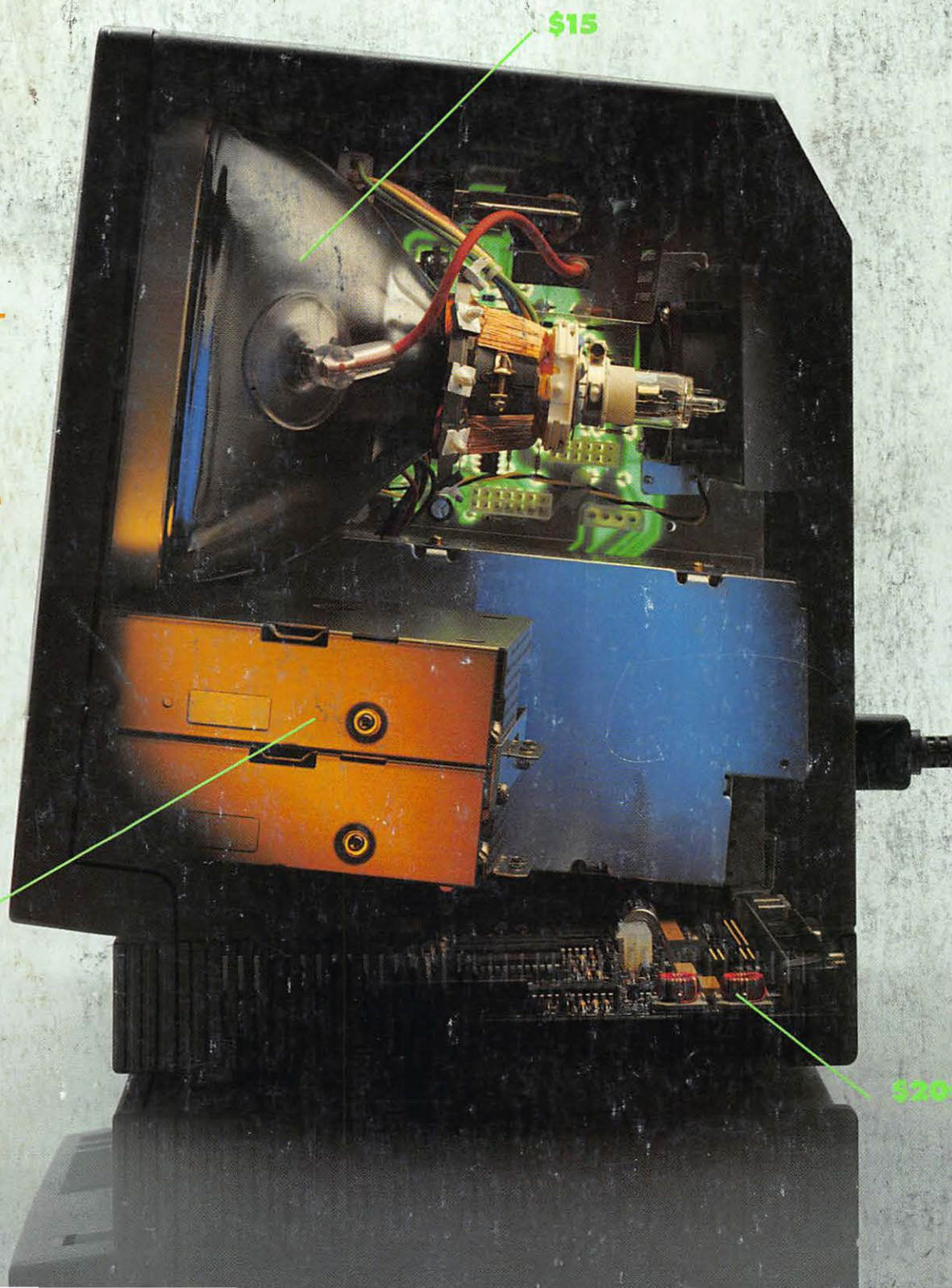
The Macintosh® Magazine

5:6

What a Mac Really Costs

The inside story

See page 114
for some surprising
answers



The fastest way to g

We have yet to meet the word processor that's perfect for everyone right out of the box.

Which is why we've built into Microsoft Word version 3 the unique ability to be customized to fit the way you work.

From modifying menus to filing away frequently used formats to designing your own dictionary, Word gives you more ways to turn our word processor into your word processor.

Don't like what's on the menu? Change it.

Menus should list the fonts and formats you use all the time. Not the ones you hardly ever use.

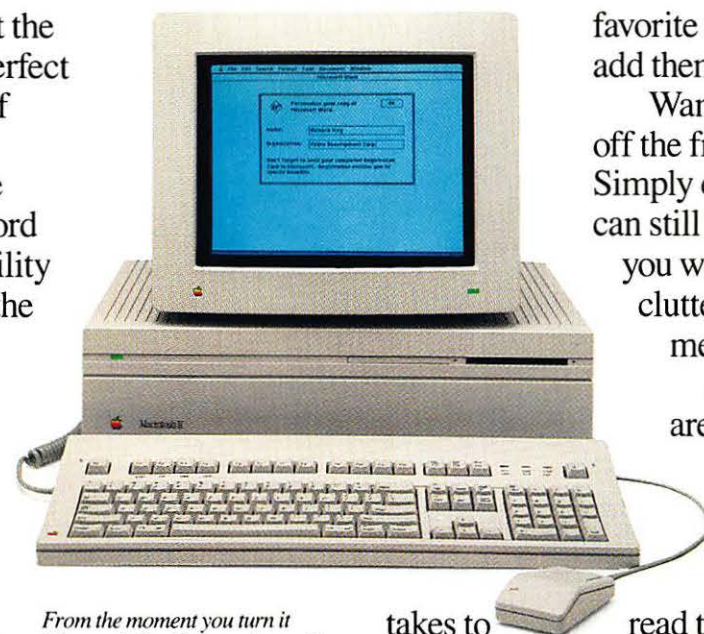
So you'll appreciate how easy it is in

Font
Boston
Chicago
Geneva
Monaco
✓New York
Times
Venice
9 Point
10 Point
✓12 Point
14 Point
18 Point

Font
Bookman
Symbol
5 Point
7 Point
9 Point
11 Point
13 Point
15 Point
17 Point
29 Point
48 Point
64 Point

Word to add the formats you want. And remove the ones you don't.

Want quick access to your LaserWriter, fonts, paragraph borders, or some other



From the moment you turn it on, Microsoft Word lets you know it's yours and yours alone.

favorite format? Just add them to your menus.

Want to take Monaco off the frequent font list? Simply delete it. You can still use it whenever you want to; it's just not cluttering up your menu.

And Word's menus are so easy to customize, you can make a change in less time than it takes to read this sentence.

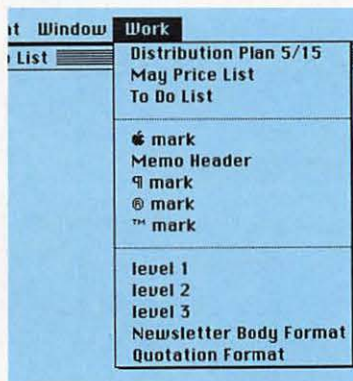
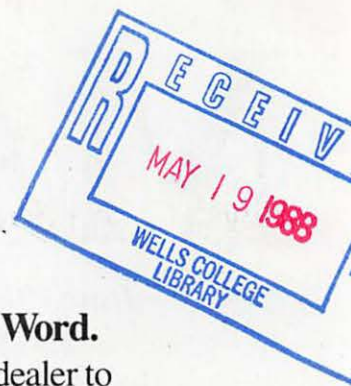
You might say they're your passport to easier writing.

Format	Format
Show Ruler	Show Ruler ⌘R
Character...	Character... ⌘D
Paragraph...	Paragraph... ⌘M
Section...	Section...
Styles...	Styles... ⌘B
Define Styles...	Define Styles... ⌘T
✓Plain Text	Plain Text
Bold	Double Underline
<i>Italic</i>	Strikethru
<u>Underline</u>	Hidden
Outline	Superscript 2.5pt
Shadow	Side-by-Side
	Page Break Before
	Keep With Next ¶
	Keep Lines Together
	Border Box
	First Page Special
	Columns 3
	Show Hidden Text

If you find yourself frequently using certain character or paragraph formats, you can add them to Microsoft Word's Format Menu. And you can take away others that you hardly ever use.

Microsoft Word makes it easy to create custom menus that list as many fonts as you want to work with.

et through customs.



Word is the only word processor for the Macintosh® that lets you create your own menu. List your most frequently used filenames, glossaries, and styles on a Work Menu where you can get to them quickly.

Add a menu. Subtract steps.

Microsoft Word lets you add a special menu that saves so much work it's called the Work Menu.

Add a Work Menu to the typical office and you may just see

some very atypical productivity increases.

That's because the Work Menu saves steps by putting your favorite formats, boilerplate text entries, and even document names a quick mouse click away.

More changes for the better.

There are lots of other ways you can make Word yours and yours alone.

Create your own custom styles—like that tricky boxed paragraph with the 13-point line spacing, tight letterspacing, and boldfaced, italicized text. And re-use it instantly for consistency in one document or across several.

You can also have your own glossary for storing text that you'd rather not retype every time you need it. Part 1(b) of the standard agreement, for instance.

And, of course, you can even customize Word's 80,000-word dictionary by adding your own unique terms.

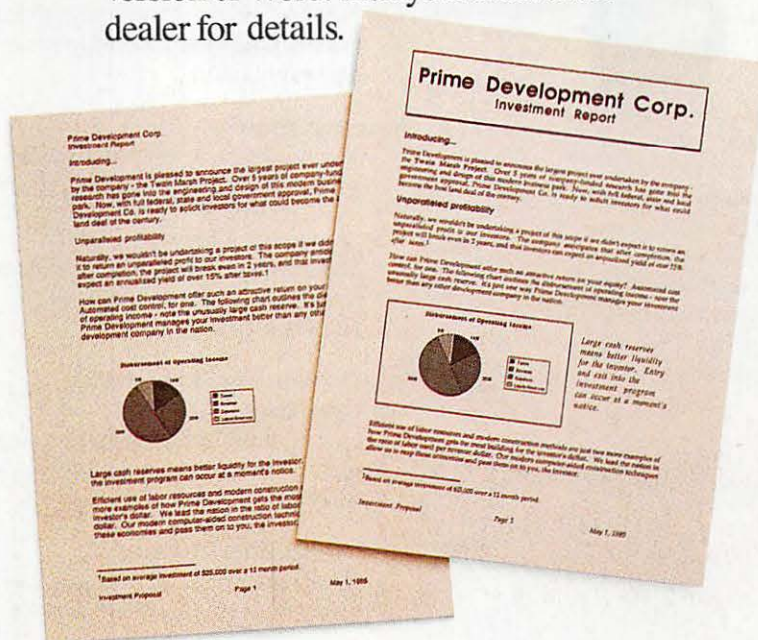
Make our Word your Word.

Ask your local Microsoft dealer to show you all of the ways Word is designed to fit you better than any other Macintosh word processor. Call (800) 541-1261, Dept. F 39 for the names of dealers near you.

In no time at all you'll be sailing through customs.

Free writing help.

Get Microsoft Word 3.02 now and you'll also get a free thesaurus, free macro program, and free upgrade to the next version of Word. Ask your Microsoft dealer for details.



One of the fastest ways to produce customized output is by using Word's style sheets. They let you change from one format to another with just a click of the mouse.

Microsoft Word



MACWORLD

June 1988

The Macintosh® Magazine

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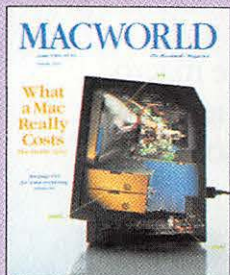
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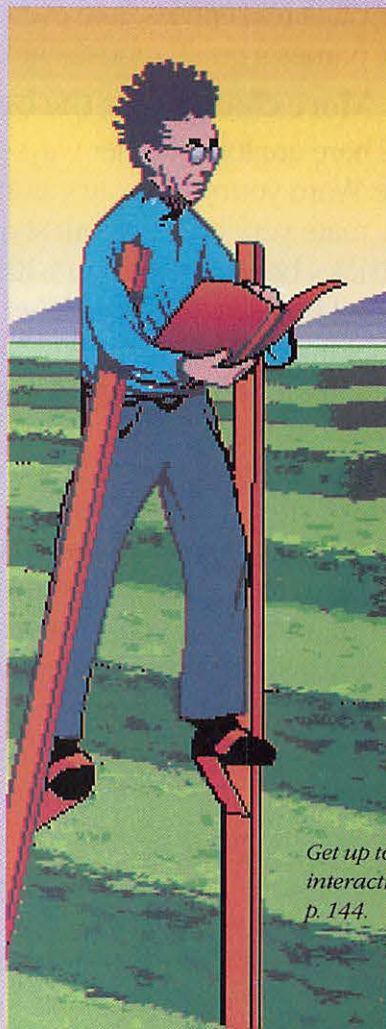
- **Mac Grows Mac** Designing plug-in circuit boards with CAD/CAM.
- **Challenging Excel** Make a strong impact with Ashton-Tate's colorful new spreadsheet.
- **Grand Finale** A sophisticated music processor puts your notes on screen while you play.

Plus, HyperCard resources, modular desktop publishing, a geographical database, and more.

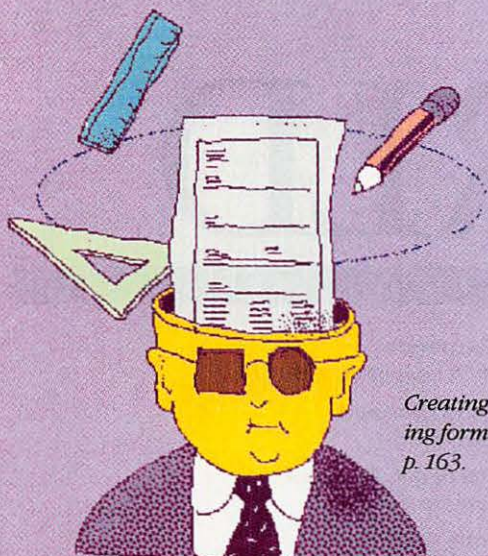


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Where does your money really go when you plunk it down on a brand-new Mac? To find out what it costs Apple to build an SE, see p. 114. (Photo by David Bishop.)



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MACWORLD

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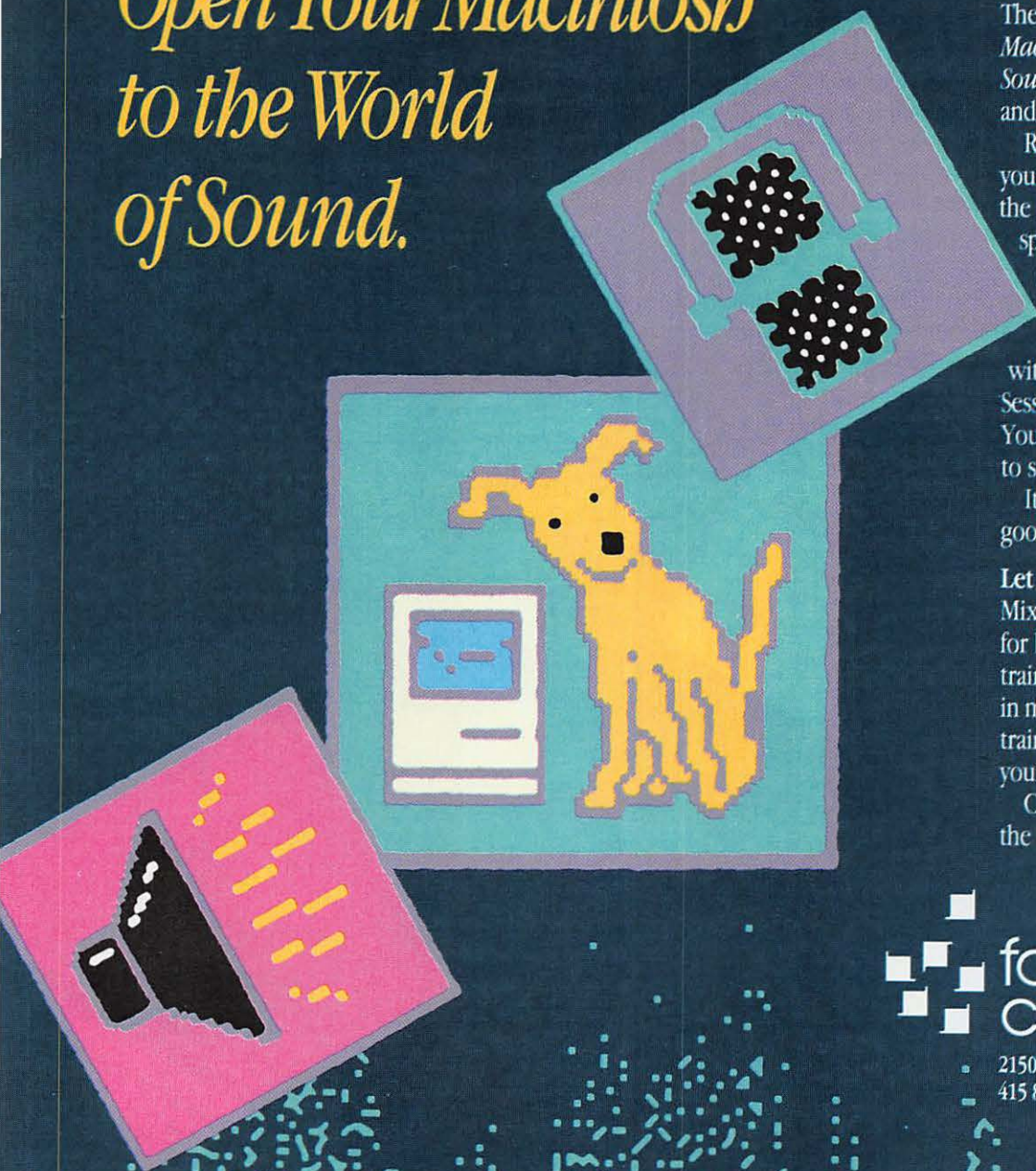
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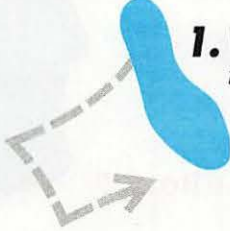
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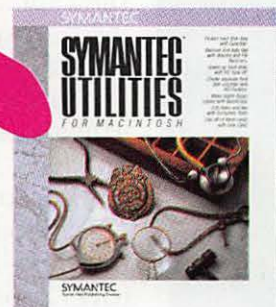
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Now's Your Chance

► Effective immediately, Apple has lowered the suggested retail price of the Macintosh Plus by \$400, from \$2199 to \$1799—the resulting street price is expected to be as low as \$1299. The new price includes MultiFinder and HyperCard software, which are bundled with every Mac.

Additionally, Apple announced suggested retail price reductions of 13 percent to 15 percent on three hard disks: the HD 20SC, the HD 40SC, and the HD 80SC. Those price drops reflect what Apple calls “recent reductions in the cost of manufacturing.” The 20-megabyte drive is now \$1099; the 40MB drive is \$1699; the 80MB drive is \$2799. Those drives will continue to come with a SCSI cable and terminator.

Apple price reductions have traditionally foretold the dropping of a product line, and sometimes the introduction of a new line. This may not be the case with the hard disks, since Apple was probably meeting heavy price competition from third-party vendors, but it could indicate a short manufacturing future for the Mac Plus.

Newsletter or Book?

► The largest national Macintosh user group, BMUG (Berkeley Macintosh users group), has published its latest twice-yearly newsletter. Issues are 350 to 400 pages, perfect-bound, and filled with

news, reviews, instructions, commentary, and not a single advertisement.

BMUG's most recent issue is highlighted by “My Favorite Word-Processor,” a multi-opinionated review written by a handful of contributors who write professionally. Also, John Sculley's recent book receives critical treatment—his corporate kingdom is compared with Betty Crocker's. Regular newsletter features include a choice-products column, a software library listing, and a free, best-of-library floppy disk.

BMUG, 1442A Walnut St., #62, Berkeley, CA 94709, 415/849-9114. Membership: \$25/half year (includes one newsletter), \$40/year (includes two newsletters). Write for a free information pamphlet—please include a self-addressed, stamped envelope.

LaserWriter Problems

► If you're using a LaserWriter printer with version 5.0 or 5.1 printer drivers on a network with older Macs, you may have a mess on your hands. On such a network, installing version 5.0 or version 5.1 on any Mac Plus, SE, or II forces users to constantly re-initialize the LaserWriter after it's been accessed by a Mac 512K. That's because the new drivers are currently incompatible with the last supported system software for the 512K—System 3.2/Finder 5.3 and System 3.3/Finder 5.4.

The next system software version (to be released early this summer) will provide a solution to this problem. In the meantime, if you have a network that includes both Mac 512Ks and other Mac computers, make sure not to upgrade to version 5.0 or version 5.1 LaserWriter drivers.

Lots More in Word4.0

► Microsoft Word 4.0, with a whole folder full of new features, will soon hit dealer shelves. List price will remain at \$395, and the upgrade from 3.01 will cost less than \$50.

Version 4.0 will include true WYSIWYG and a collection of tools for creating tables and forms. Outlining is much improved and there's background repagination—no more waiting for ¶J. Speaking of speed, that's been increased too, using *caching*, which updates only the section of a file that's been modified—especially useful in long documents.

Bundled with 4.0 will be Silicon Beach Software's SuperPaint 1.1, which can be used to create graphics to dress up a Word document. Color text will be available to those with a color monitor. New customization features include macros, which let one keystroke initiate many functions, and menus, which can be changed to give any desired ¶-key equivalent. Also, look for upgrades to Excel, File, PowerPoint, and QuickBasic in the near future, and later to Works and Mail.

Cheaper Macs?

► Apple can now produce Macs that are significantly less expensive by using three special chips it developed for its long-awaited laptop computer. The new chips replace many now on Plus and SE logic boards.

Not only do these large-scale integrated circuits save precious board space and require less power, but they can also form the basis for 16 MHz-based Macs that operate at twice the speed of current Pluses and SEs.

Because Apple can now produce cheaper Macs, it may be paying especially close attention to the response of its price reduction on the Mac Plus to see if “the rest of us” will really purchase lower-priced Macintoshes.

Mac II Fixes

► At first, Apple claimed that the Mac II could directly address up to 16 megabytes of memory on any configuration of the Mac II logic board or NuBus add-in boards. Unfortunately, that wasn't true. Mac IIs produced before February of this year couldn't recognize memory greater than 1MB on a NuBus board. This situation posed significant problems—especially for buyers of National Semiconductor's NS8/16, a 16MB memory card for the Mac II.

(continues)

To remedy the problems, Apple is now offering a Mac II logic board upgrade program, at no charge to customers with NuBus boards requiring more than 1MB of address space in the Mac II. The same upgrade also replaces on the Mac II logic board one of the NuBus support chips (called *HALs*), which occasionally refuses to relinquish NuBus control to an add-in board, as required by a program.

The new logic board includes new Mac II ROM chips that correct the memory-addressing problems, as well as a new NuBus support chip. Since the HAL chip is soldered directly onto the Mac II logic board, the only upgrade possible is a board swap.

Apple is now shipping Mac IIs with the new logic board. The new board can be identified by the new ROM chips, which are labeled Revision B. A/UX is compatible with either version of the ROM because the operating environment is independent of the ROM. The upgrade program will be available until 1994.

Apple's Lawsuit

▶ Apple says its suit against Microsoft and Hewlett-Packard (announced March 17) is designed to protect Apple's "audiovisual display against infringement" by two products: Microsoft's Windows 2.03 and Hewlett-Packard's New Wave.

Financial analysts wonder if Apple's dramatic legal challenge will strengthen the Mac's position by obstructing efforts to bring Macintosh ease-of-use to Big Blue's new computers. Such a slowdown might give Apple another year to increase the Mac's 11 percent share of the personal computer market.

Those who favor IBM products wonder if Apple's suit will deny them the pleasure of running Mac-like programs on MS-DOS computers, or at the very least, if it will slow down creation of such software by developers now wary of litigation that challenges the legality of Windows 2.03 and New Wave.

Some predict that Apple's legal challenge will be settled quickly, out of court. Others say Apple can only gain by keeping fear and doubt rampant in the IBM community for as long as possible.

Had Your Vaccination?

▶ You can largely protect your Macintosh against secretive and damaging "viruses" by installing Vaccine 1.0, a free program from CE Software that's available on CompuServe, GEnie, Delphi, and MacNet. Simply slip this small (12K) program into the System file, restart the Mac, and you're protected against the simpler forms of virus that sometimes infect computers and then wreck files and programs. Instructions about how to use Vaccine can be found by opening the Control Panel.

Vaccine was written by several of CE's programmers, including Don Brown, who said he was prompted to devise a protection scheme following the discovery of a virus that reportedly caused a peace message to flash across the screen of several hundred thousand Macintoshes on March 2. Brown said he's against all viruses, even the ones that do no damage, because they weaken people's control over their computers.

E-Mail That's Easy

▶ CE Software claims to be offering a new generation of electronic mail. QuickMail, which reportedly has nearly all the features of Microsoft's Mail and Think Technologies' InBox, operates by itself or over TOPS or AppleShare. In addition, this desk accessory offers a multitude of unique features including automatic forwarding of messages through various information services such as CompuServe, GEnie, AppleLink, and MacNet.

QuickMail stores personal messages on each individual computer; this allows someone to take a computer home from work, process messages, create new ones, and then send the new messages immediately after reconnecting to the network. QuickMail also has its own forms generator so users can design the equivalent of a personal message pad, for example.

QuickMail will retail at \$300 for each ten users. A videotape for employee training and product familiarization is available for \$49.95. For further information, call CE Software in West Des Moines, Iowa, at 515/224-1995.

Public Domain Software on CD ROM

▶ BMUG is offering a CD ROM that contains the equivalent of one hundred and fifty 800K disks of public domain (PD) software and shareware, as well as digests of public messages from selected electronic services.

PD ROM, which is being produced for BMUG by Discovery Systems, will be available as a public service for un-

der \$100. PD ROM is designed for use with Apple's CD SC drive and HyperCard software. The contents of the disk will be tested and screened for viruses prior to publication. For more information, call BMUG at 415/549-2684.

Early Retirement for Mac Pascal

▶ Don't hold your breath waiting for version 3 of *Macintosh Pascal*. A reliable source indicates that the only Apple-label programming language ever released for the 128K Mac will no longer be supported by Apple. Designed for the educational market by Think Technologies, *Macintosh Pascal* was praised for its unusually friendly and forgiving user interface—but certainly not for its speed.

In the years since *Macintosh Pascal* was developed we have seen the release of several more-powerful and faster Pascal compilers, including Think Technologies' *LightSpeed Pascal*, a supercharged professional development system that retains the friendly user interface of its aging sibling.

Recently Apple decided to withdraw support for *Macintosh Pascal* in the hope that users would migrate to third-party languages. Although Apple has no plans to rewrite the product to make it compatible with *AppleShare*, the Macintosh II, or future Apple products, *Macintosh Pascal* will still be available through Kinko's Courseware Exchange and Apple Programmer's and Developer's Association. □

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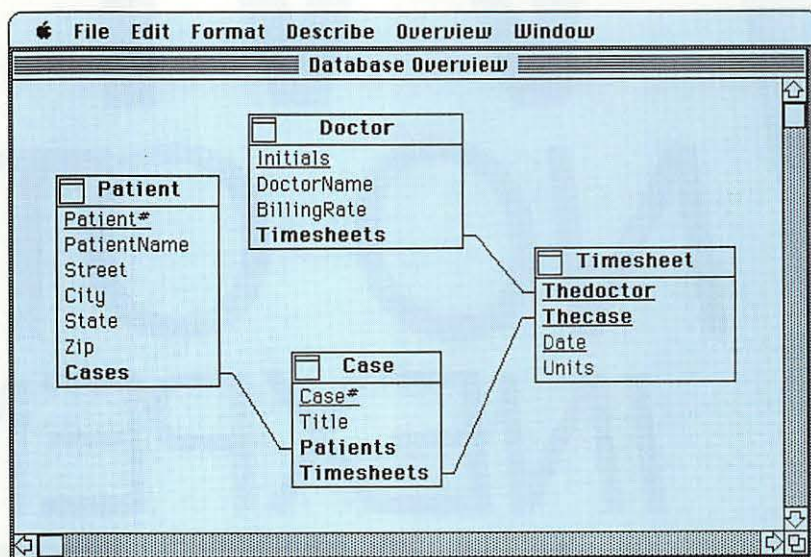
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- Truly relational database manager
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You simply draw connecting lines to relate one item to another.

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David Smith, MacTutor ”

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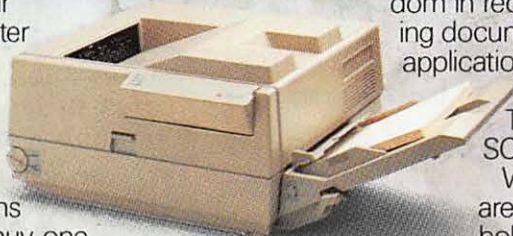
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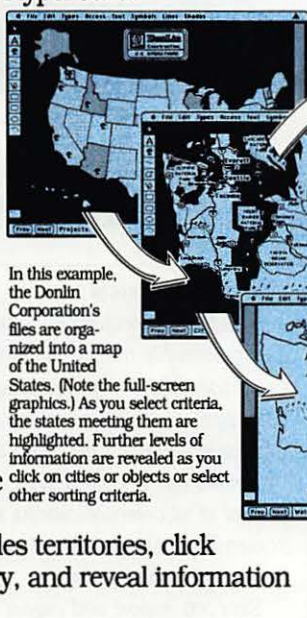
An impressive list of major companies and government agencies that use the Macintosh™ own Business Filevision, the graphic file management system. And they're still ordering copies today. Because Business Filevision will do things that no other program can.

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So what is Business Filevision, anyway?

It's a data base program that stores data using graphics as file directory devices.

In other words, you could create (or import) a map of sales territories, click on a territory, and reveal information about it.



In this example, the Donlin Corporation's files are organized into a map of the United States. (Note the full-screen graphics.) As you select criteria, the states meeting them are highlighted. Further levels of information are revealed as you click on cities or objects or select other sorting criteria.

More important, unlike other programs that seem to do similar things, it allows you to select several criteria so that you can sort and analyze data 'behind' the images. You can incorporate computed fields and statistics. And you get real flexibility in

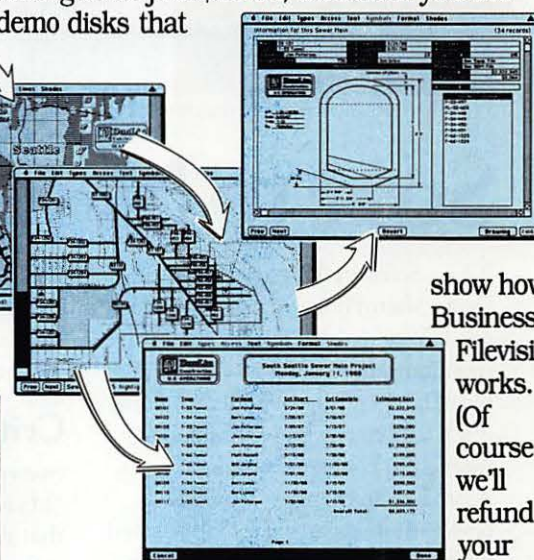
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From the beginning, Filevision was so revolutionary, people were at a loss to describe it, but they were crazy about it. AFIPS* gave it their "Outstanding Software Product of the Year" Award.

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When Software Ventures set out to create MicroPhone, it had a simple mission: to develop the most intuitive communications software ever written. Indeed, when MicroPhone was born, it was universally hailed as a breakthrough in communications software. A product so friendly, it turned novices into experts. So sophisticated, it became, in the words of MacUser, a power user's delight.

MicroPhone is a legend. One of those precious software creations that single out the Macintosh as a superior computing machine.

With MicroPhone II, Software Ventures has set out to surpass itself: redefine power in telecommunications for years to come.

MicroPhone II is so revolutionary that PC Magazine was moved to say: "MicroPhone II is arguably the best

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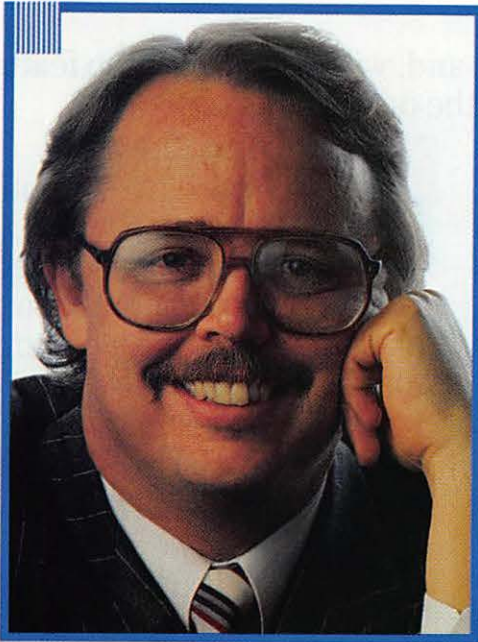
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The Clash of the PC Titans



Will Apple succeed in fighting off the Interface Infidels? Or will Microsoft control the destiny of personal computing? Stay tuned.

"Do you remember the clash of the PC titans, many thousands of upgrades ago, when the Great Icon did battle with the Wizard of the Northwest?"

As the HyperChronicler began to download his epic, the network travelers huddled around the glow of their screens. It was a good night for saga sharing. Five hundred thousand screens in America alone were glued to the HyperChronicler's bandwidth, and there was to be a delayed-transmission simulnet over the Glasnost Network.

The Japanese had ringside seats, and NEC, Fujitsu, and Hitachi forked out several hundred million DRAM to be corporate sponsors. Digital hawkers were busy selling T-shirts emblazoned with CD-I and Ted Nelson Memorial HyperButtons on the network. Excitement was building audibly in the Data Dome. The lights and music slipped into hyperdrive, and the myth telling began.

The HyperChronicler told his tale. Splices of antique television documentaries, neolithic software programs, and yellowed clippings from ancient pages of the *Wall Street Journal* played on the screen, capturing the apocalyptic mood of those tumultuous days.

The year was 1985. The Great Warrior, Lord Sculley, rose to the leadership of the Apple tribe after he expelled Steven P. Shaman from its midst. Gassée the Urbane was appointed Senior Vice-Merlin of Magical Development. The neighboring tribes in the valley saw the proprietary smoke signals and shuddered. The powerful sorcerers of the Hewlett-Packard and Xerox tribes took heed and began to stockpile their arms. Big Borland watched warily from a distance. The Shogun of Symantec went on the alert.

Lord Sculley was locked in a dispute with the Great Gates over the Macintosh-like user interface of Microsoft's Windows 1.0. Gates, called by some the Wizard of the Northwest, had the upper hand because

the Apple tribe had recently been attacked by the biggest tribe of all, whose campgrounds lay far to the east, in the forests of Armonk, New York.

The Atman of Apple and the Master of Microsoft met face-to-face, not on the battlefield, but in Chief Esther Dyson's enclave. Sculley knew he had to make peace with Gates because Apple's enemies were all over the valley. And, after all, Microsoft was creating software spells and applications for the Macintosh. Both tribes entered into a peace treaty, of sorts.

But Sculley knew the day would come when he would again face the Wizard of the Northwest. The Great Warrior met in secret with a member of his High Council—an excellent organizer and skirmish-fighter named William Campbell. Together they developed a plan to split off part of the Apple tribe and create Claris, a smaller software family. Sculley wanted to be certain that Apple would never again be dependent on a foreign software tribe like Microsoft.

While Lord Sculley armed his new software flank and prepared for the next confrontation, Apple and Microsoft engaged in verbal warfare, hurling taunts at one another. Gassée the Urbane railed against the weakness of other tribes who licensed their crown jewels to enemy camps.

And Sculley declared that Apple was the strongest company in tribal computing precisely because it owned its own operating system. The tribe from Armonk, though immense, was entirely dependent on Microsoft. In fact, all of the major tribes—the Hewlett-Packards, the Compaqs, the Tandys, and even the Great Eastern Clones—depended on Microsoft for their systems.

(continues)

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Here are a few of the new ways you'll have to exercise it.



Text Wrap

Our new text wrap function gives you the choice of flowing text through an object, jumping over it or wrapping around it, like you see here.

And when you move a graphic, your text will automatically reflow around it. You can also control the margin between

text and image and, with a custom wrap feature, fit text to even the oddest shape.

TECHNICAL PAPER

kind of delay potentially unaffordable. A single such delay could not only wipe out the savings of these tires on that unit, it could lose a valued, profitable customer, thereby substantially reducing revenue.

Fleet standardization is another difficulty today with wide-base tires. These tires cannot be used on many older vehicles due to their lateral wear problems and propensity for irregular wear caused by light loading. Fleets therefore would have to purchase a conventional type of tire for the steering positions. The problem with that is retreads are not generally used on steer axles and the retreaded tires wouldn't fit at any other position.

Equipping today's trucks with wide-base singles is also costly from a purchase tax standpoint. Since the Federal Excise Tax (FET) for a 212-pound 16,622.5 is \$7.50, the total purchase price of the wide-base standard radial, is now much closer to the cost of two low profile tires whose total FET is \$48.00. The small price advantage, as well as some of the cost savings of the wide-base singles, can be more than offset currently by the added cost of the special axles and wheels they require.

Wide-base singles may be the tire configuration of the future. New materials and constructions could increase their value while new tread designs and compounds may reduce their disadvantages. Should a reliable, self-sealing liner be developed to eliminate equipment downtime and freight delays, the acceptance of this type tire would be appreciably accelerated.

To summarize, the following is what we consider realistic and achievable in five to ten years.

Low Aspect Ratio Tires: These must exhibit reduced rolling resistance, weight and size to increase vehicle payload and decrease fuel consumption. Fleet operators will want to choose between dual low profile tires for other than steering positions or low aspect ratio wide-base singles, which offer further advantages in weight and rolling resistance over dual low profile tires.

Hardware for Low Aspect Ratio Tires: In order to maximize these tires' performance, truck manufacturers must design equipment to fully accommodate the smaller diameter tires. As soon as practical, suspensions must be redesigned to be compatible with the springing characteristics of radial tires. Reduced tire size may also create a need for redesigned transmission and drive axle gearing.

Hardware for Wide-Base Tires: Axles will have to be lengthened to situate these tires correctly under 102" wide trailers. The added room afforded may provide for more design creativity in the brake and sus-



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Is Turning 3.0

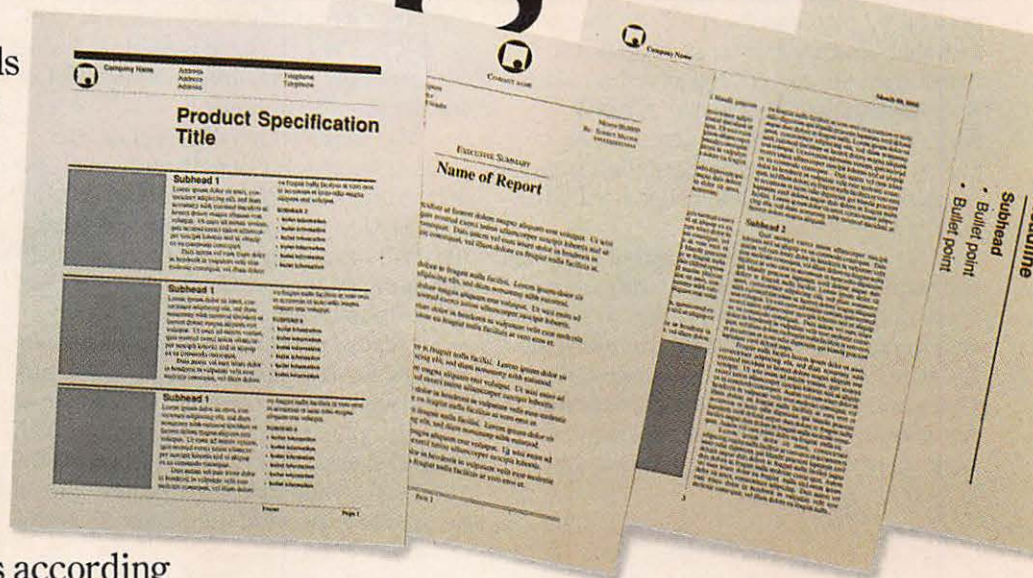
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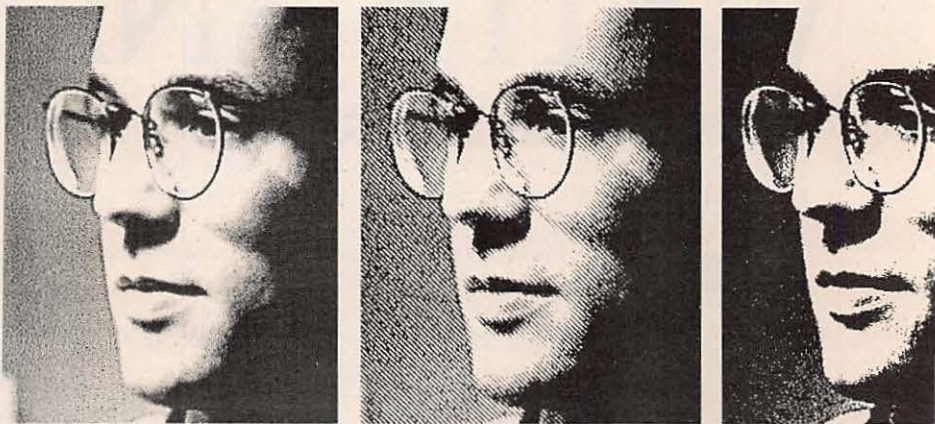
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You can now adjust the lightness or contrast of any scanned image or bit-map graphic you place in PageMaker.

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And ask for the program that did a number on PageMaker.



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Thus it came to pass that by 1987 the Wizard of the Northwest was suffusing the magic of Macintosh through Windows, and also that Hewlett-Packard developed a New Wave incarnation of the Macintosh that worked with the nefarious Windows 2.03.

Apple began to fear these alliances. Its secret weapon had been stolen, and barbarians were adapting the powerful magic to their own inferior weapons and machines. One tribe, the Lotusians, was developing a 1-2-3 spreadsheet for the Macintosh that promised to be as good or even better than Microsoft's Excel. Ashton-Tate was developing a Mac dBase. A Word-Perfect for the Macintosh was underway too. And High Counselor Campbell was developing high-end Macintosh software in the fiefdom of Claris.

So Lord Sculley decided that 1988 was the right time to make Apple the only personal computer company in the world that was free of Microsoft's spell. He unleashed his army of attorneys to challenge Great Gates and the howling Hewlett-Packards. Apple petitioned the High Judiciary to keep Microsoft and Hewlett-Packard from

stealing the magic of Macintosh and providing its secrets to all the other tribes.

Would Sculley emerge victorious? Would the advancing software warriors plunder civilization as Apple knew it, so carefully cultivated in Cupertino?

I cannot tell you how the Hyper-Chronicler finished his saga that night in the Data Dome, but I can tell you that the clash of the PC titans is really a battle between different visions of the personal computer world. There is Microsoft's MS-DOS-OS/2 vision; there is Apple's; and let's not forget the UNIX dream. Which vision will eventually succeed?

The implications of this clash are great. If Microsoft is legally prevented from delivering its interface technology (called Presentation Manager) to IBM, perhaps IBM will have to develop a more accessible operating system of its own—or go elsewhere to find one.

Meanwhile, a small group of people from Xerox PARC has split off to form a new company that plans to develop yet another graphic interface. Who knows? Maybe they'll end up licensing it to IBM. Then Microsoft would lose big, because it would be unable to provide the personal com-

puter industry with the number of products it now controls. Mind you, Microsoft's loss isn't necessarily Apple's gain.

If the powers-that-be don't act quickly on Apple's lawsuit against Microsoft and Hewlett-Packard, there will be much uncertainty about Microsoft, and about Apple as well. And this may open up the market for workstation manufacturers, especially as their prices fall to the level of Apple's high-end Macintoshes. One winner in particular could be Sun, with its open-architecture RISC machine, SPARC chip, and UNIX operating system.

No matter what happens between the warring tribes, they should watch their backs. While Apple is busy battling its rivals, I have recently read that IBM has offered to supply vital computer chip technology to its archrival, Digital Equipment Corporation. Why? Because Big Blue doesn't want DEC to become too dependent on Japanese suppliers. The Hyper-Chronicler will have his work cut out for him in future installments of the epic tale of the titans. □

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WHY WE DON'T MAKE JUST ONE LURE FOR EVERY FISH IN THE SEA.



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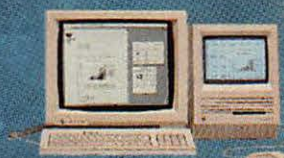
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The Big Picture CX showing color CAD drawing.



The Big Picture with Double Feature software displaying word processing and spreadsheets.



The Big Picture C20 displaying a color photograph.



The Big Picture for the Macintosh II showing Excel™ spreadsheet.



DoubleColor card showing full page presentation running on NEC Multisync™ Plus.



The Big Picture IQ™ photographic image on grey scale monitor.

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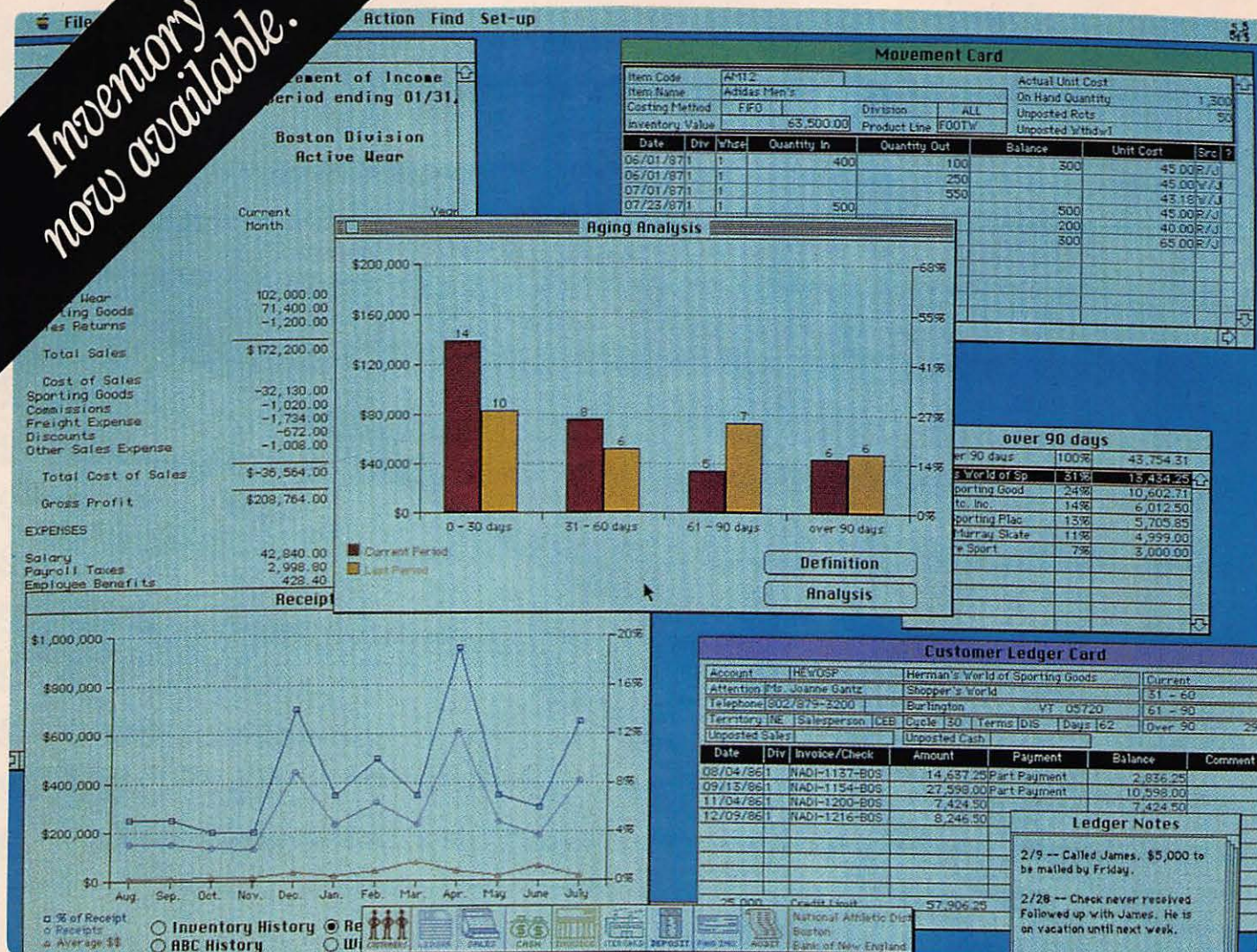
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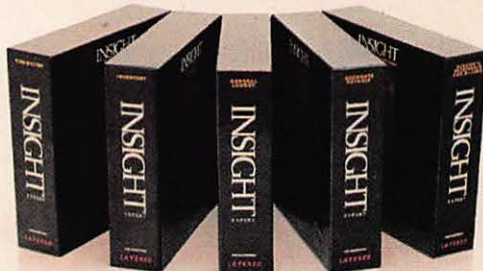
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Letters

A forum for Macworld readers

Beware of Betaware

We have both PCs and Macs in our office and have long awaited truly compatible word processing software. After a few hours of trying to use the beta copy of WordPerfect we ordered at the Macworld Expo, we found so many bugs that I'm not sure we should ever implement it. WordPerfect Corporation should never have released a beta version to the public. I guess perfection is a relative term in the software industry.

Bruce L. Belton
Redding, California

Not only do software publishers take risks when they release unfinished programs to the public, but users risk losing data when they use beta software. The stakes are even greater in a networked environment. Of course, bugs often show up even in "finished" programs after their release. That's why some companies provide free upgrades to their early customers. —Ed.

The Match Game

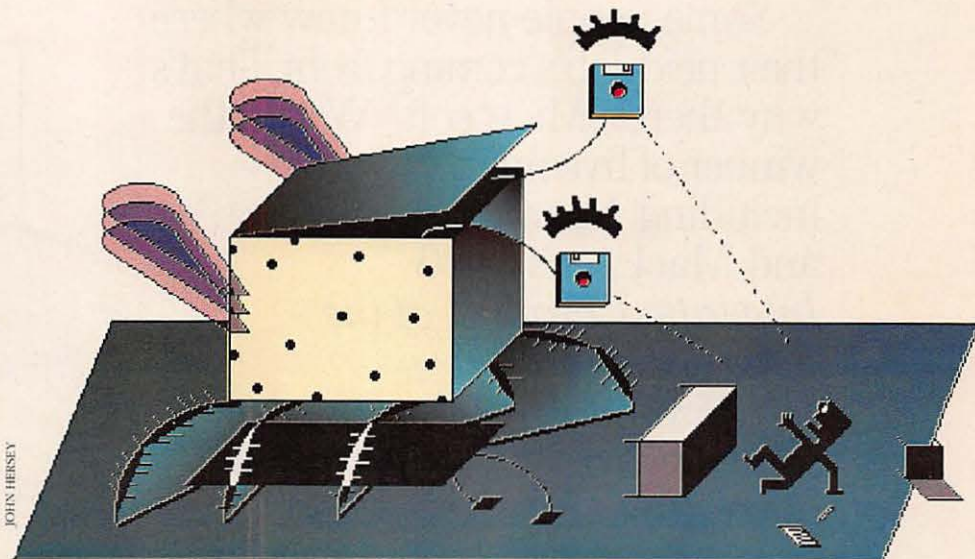
Are there any national, regional, or local services that match personal computer service sellers—such as software trainers, hardware and software consultants, and free-lance computer operators—with people who need those services?

Victoria Wingard
Seattle, Washington

XXCAL, in Los Angeles (213/477-2902), provides contract programming and job placement matchups throughout Califor-

Corrections

The address for Software Complement (Business Buyer's Guide, November 1987), maker of P-O-S/Mac, Client/Mac, and Complementary Type, is 8 Pennsylvania Ave., Matamoras, PA 18336, 717/491-2492.



nia. Aldus, through its Authorized Training Program, provides its end users with trainer referrals throughout North America (call Aldus Customer Service at 206/622-5500). Many Macintosh user groups also act as clearinghouses for consulting and training services. —Ed.

Rough Sketch

The new illustration programs such as Adobe Illustrator and Aldus FreeHand are supposed to be based on the way illustrators actually work. But how many illustrators pick up a rodent and start drawing? Do they use the tail or the nose? I'd like to see something in print about digitizing tablets.

Claudia Krysiak
Chicago, Illinois

We reviewed two of them, Macintizer and MacTablet, in our March 1987 Reviews section. —Ed.

To the Rescue

After jiggling around with the background colors on my new Mac II, I discovered I couldn't reboot without getting the bomb. Then, like a visit from a superhero, my Feb-

ruary issue of *Macworld* arrived. I turned to *Mac Bulletin* and could not believe my eyes when I saw the "Balky IIs" item about the PRAM's control over the II's booting characteristics. Sure enough, my problem was solved. Not only did I not have to take my Mac back to the dealer, but I gained the satisfaction of finding that even a novice like myself could fix the problem. How do I spell relief? M-A-C-W-O-R-L-D!

Michael Qseng
via MCI Mail

Printing Problems

In her review of Letraset's prerelease version of ImageStudio (December 1987), Erfert Nielson said she had problems printing EPS and TIFF files (pasted into PageMaker 2.0) on the LaserWriter. We've had no difficulty printing EPS and TIFF files imported from ImageStudio to PageMaker 2.0. None of our end users have reported PageMaker printing problems either.

Michael Rennert
Letraset USA
Paramus, New Jersey

The problem may have been caused by a glitch in Macworld's network or by a bug in the not-quite-final version of Image-

(continues)

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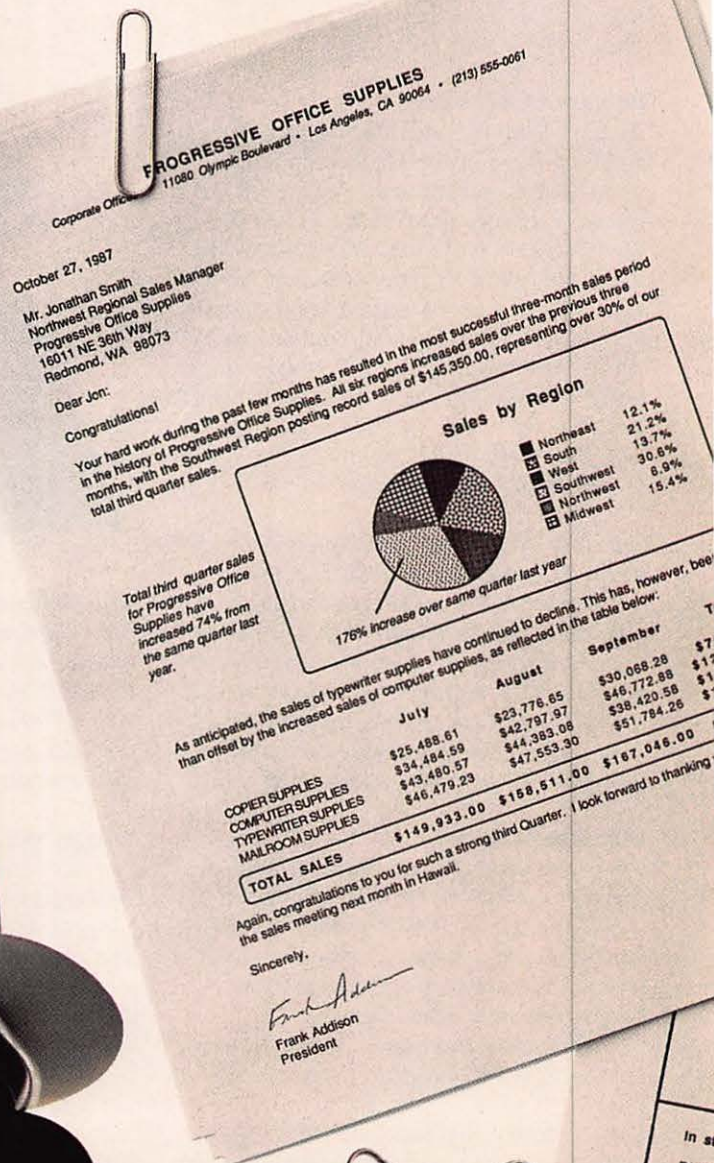
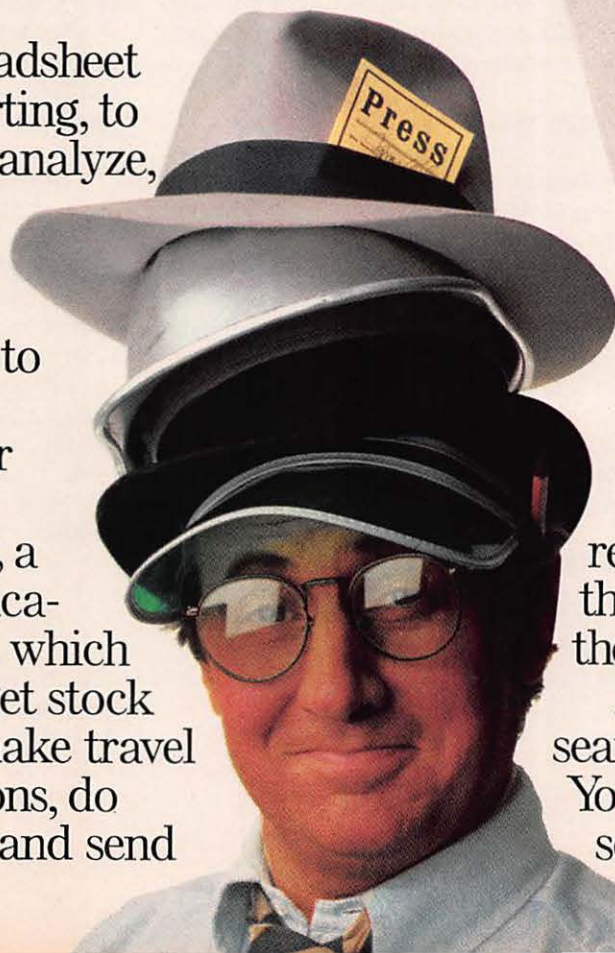
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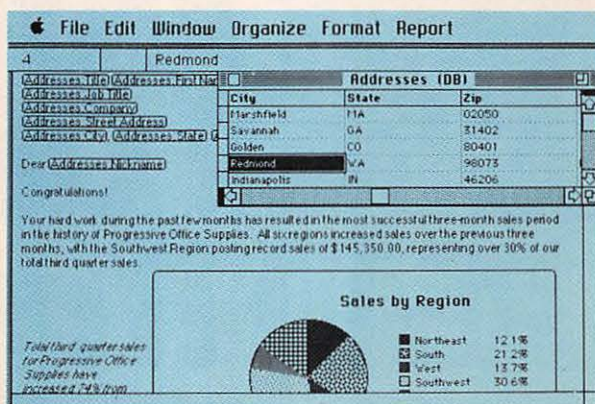
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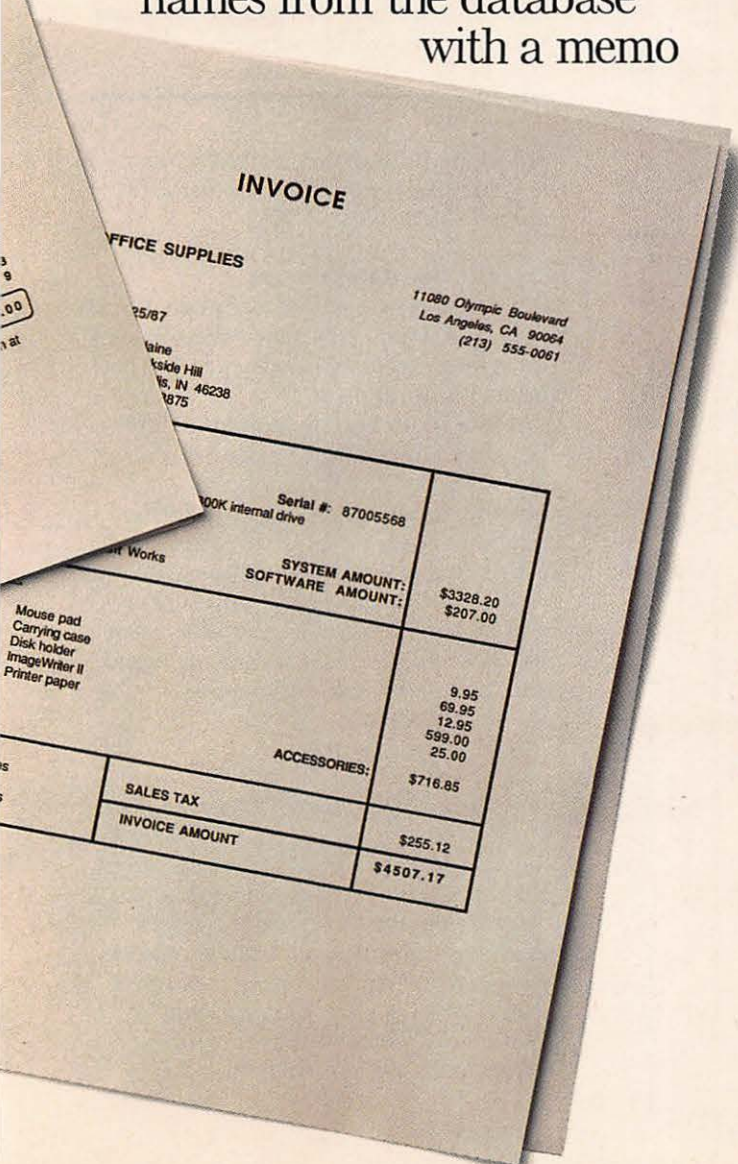
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Letters

Corrections



LaserView on Display

Sigma Designs' redesigned LaserView display ("The Mac II in Black and White," May 1988) sports a tilt-and-swivel stand plus front-mounted controls.

Studio. We have since adopted a firm policy of not reviewing software before its commercial release. —Ed.

Graphic Word Processor

Although your comparison of word processors ("Just Write," February 1988) was well done, I wanted more—half a page on each product is not enough.

Why didn't your feature list include the "ability to place graphics alongside text"? I chose Laser Author because it was then the only word processor with this capability. Some other features missing from the table were "compatible with large-screen displays," "supports arrow keys for cursor movement," and "compatible with MultiFinder." Or does every program have these features by now?

Evan J. Romer
Windsor, New York

Our purpose was to provide an overview. We didn't include graphics-text flexibility because it's considered more of a page-layout than a word processing feature. (Word allows graphics alongside text; other not-yet-released word processors are expected to.) No standard exists for testing large-screen compatibility. As for MultiFinder, it had not been released when the article was written. —Ed.

(continues)

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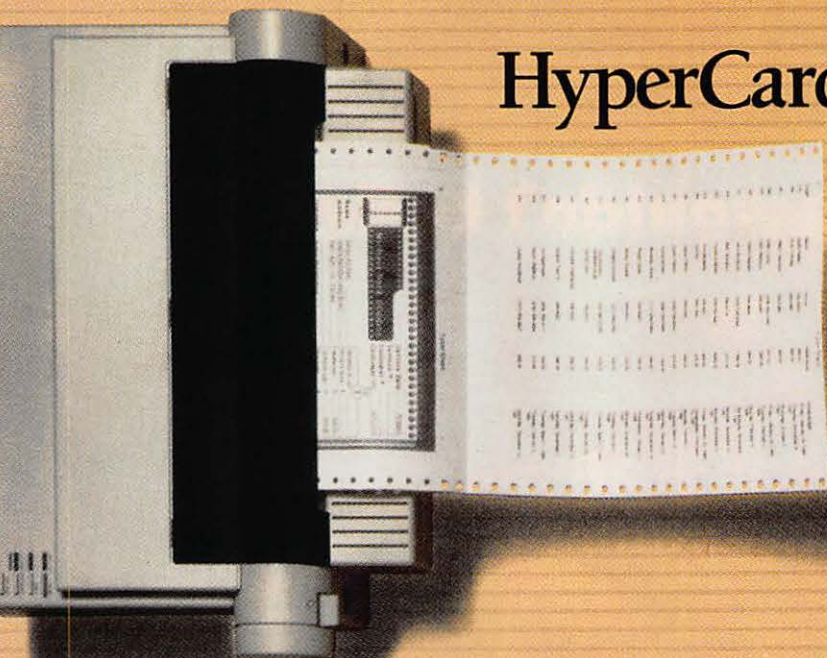
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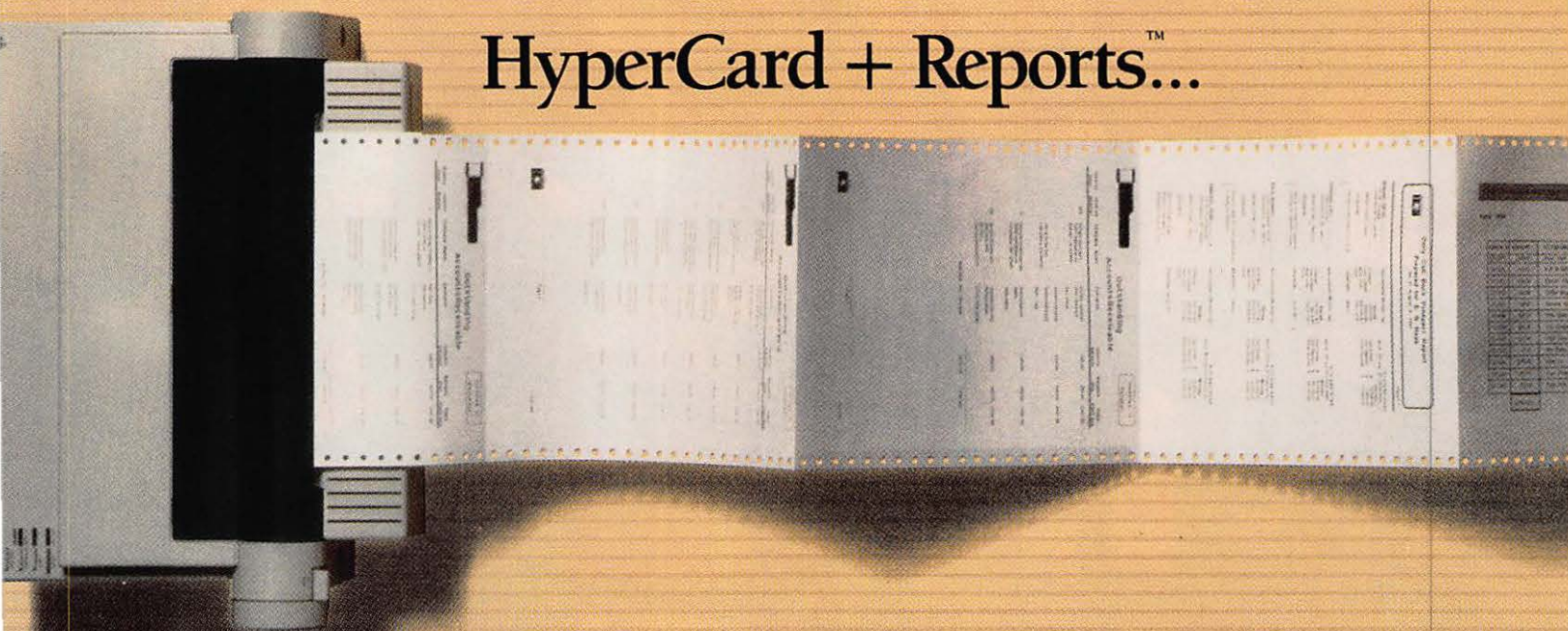
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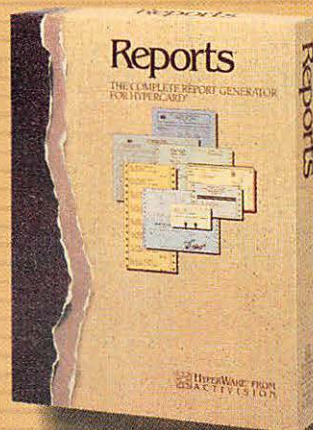


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Letters

Color Blind

Freedom of the press also means freedom of misinformation. Your recent comparative review of Modern Artist and PixelPaint ("Live and in Color," February 1988) contains serious errors (price), critical omissions, and general misinformation.

*Jimmie A. Moglia
Computer Friends
Portland, Oregon*

The article was an introduction to color paint software, not a review. Certainly some of Modern Artist's features were omitted, but some of PixelPaint's were as well. Modern Artist's revised price (\$199) had not been set at press time.

True, the sphere in the illustration didn't do justice to Modern Artist's color-blending capabilities; the program does an excellent job on gradient fills in Expert mode. Other unique features are multicolor brushes, "wet canvas" blending, and online help. —Ed.

Extended Keyboard

I would like to see Macworld publish a detailed article on the Mac's extended keyboard. I'm unable to use my keyboard's numerous special-function keys, since the keyboard came without instructions and I don't know how to program my software to recognize the keyboard's inputs.

*Glenn O'Brien
Governors Island, New York*

You sound like a good candidate for QuicKeys (Reviews, January 1988), the key-mapping utility by CE Software (515/224-1995) that lets you easily define numerous sets of keystroke operations for your system and applications. —Ed.

Computer Convert

As an older academic editor who's become intrigued by the computerized way of handling words and data, I was utterly delighted to find in your January 1988 issue the outstanding articles by Steven Levy ("Tales of the MultiFinder") and Jim Heid ("Getting Started with the New Mac System"). Levy gives a clear history of desktop replacements and the origins of MultiFinder, while Heid's is the most practical guide to the new Mac System I have seen.

*Mario S. De Pillis
Amherst, Massachusetts*

(continues)

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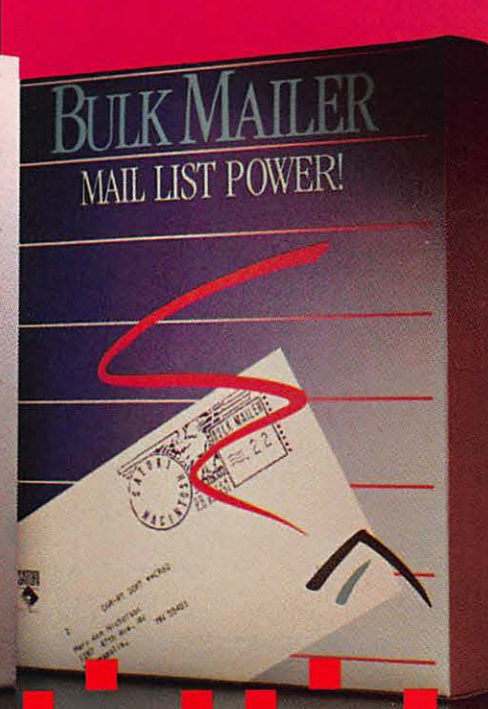
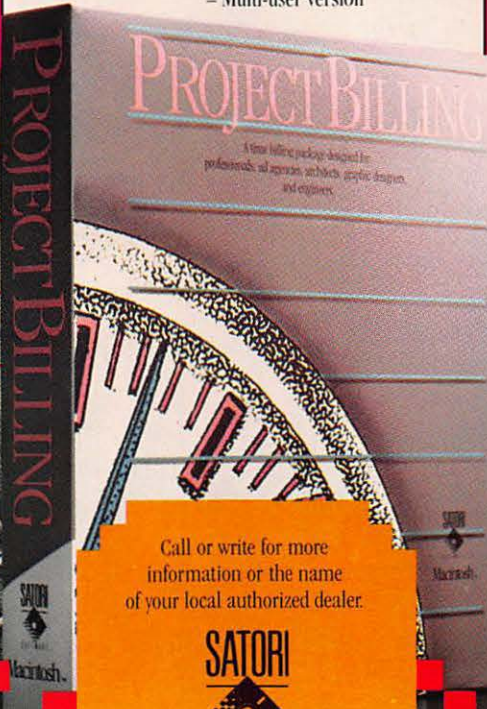
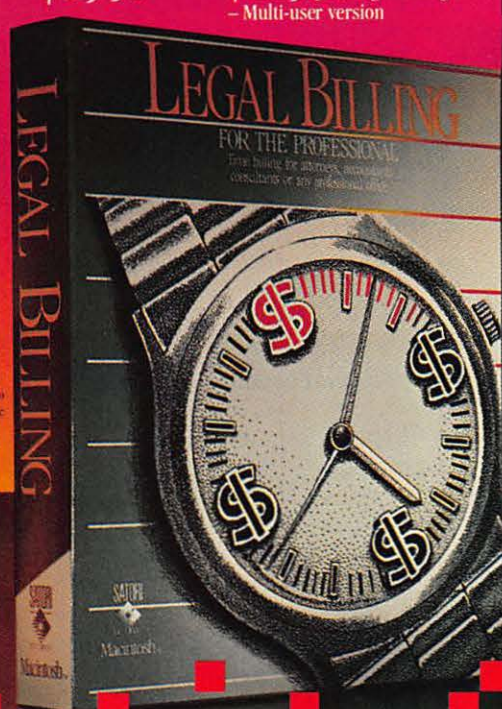
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Letters

Go by the Board

As editor of *The American Go Journal*, I found Charles Seiter's review of Go for the Macintosh (*Reviews*, January 1988) peppered with misrepresentations. I challenge Seiter to find a university go club where Go for the Macintosh could "take on good human opponents." Go for the Macintosh claims a rating of 18 *kyu*—a level most beginners reach before playing 100 games.

Roy Laird
Brooklyn, New York

While it's true that Go for the Macintosh can never compete with expert players on a full board, if you experiment with the defaults (including strategy, tactics, and move-search depth) and restrict the board size, you can make it reasonably challenging for recreational play.—Ed.

Jewel in the Crown

The January 1988 issue was a gem, and the network articles the crown jewels. Keep up the good work.

John S. Baumgarten
Los Angeles, California

Brand X

Although pleased with Robert Eckhardt's favorable review of our Word Finder (*Reviews*, February 1988), we were surprised and disappointed to see it referred to as a "non-name-brand thesaurus."

As the world's most widely used electronic thesaurus, in many circles Word Finder is prestigious indeed.

Mike Weiner
Microlytics, Inc.
via MCI Mail

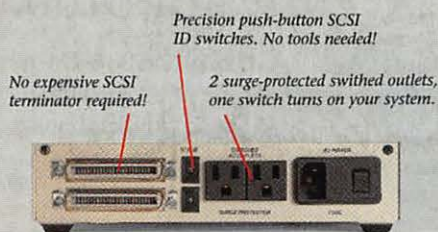
Our reviewer was referring not to Word Finder itself but to the thesaurus on which it was based—one created specifically for the program—which he did not consider up to the level of the classic Roget's.—Ed. □

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to Macworld). Include a return address. Due to the high volume of mail received, we regret we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.

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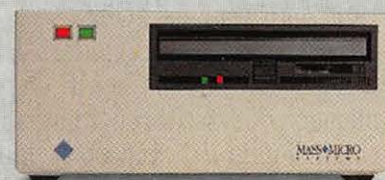
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Publishing the Magazine That Could Be

*Desktop publishing on the Mac—
almost ready for prime time*

Recently we've had several discussions in our office about desktop publishing *Macworld*. The trouble is that for a publication like *Macworld*, the technology that we spend so much time covering has simply not been suitable. Producing a magazine that meets our expectations of quality, especially typographical quality, has prevented serious consideration of DTP.

But several recent product announcements have encouraged me to think that it is time for us to reconsider DTP. Electronic publishing may now be practical without the specialized publishing workstations used in the halls of Time Inc. or the advertising industry.

Collecting Information

Text input is the easiest part to accomplish with today's tools for the Macintosh. We have a wealth of good word processors and dictionaries (I'm using MacWrite 5.0; you should check it out, it's much improved). Converting text from one format to another is pretty straightforward. At least, running TOPS or MacLink Plus to move text from PCs to the Mac is much simpler than putting ASCII code through a Shaftstall device, which is what many printers had to do in the old days.

Screen fonts and display (headline-size) type are now available at acceptable cost, so we can see the type we're going to get. We produce dummy type for our cover, for example, on our laser printer.

Capturing printed text from existing documents through optical character recognition (OCR) remains about as primitive

a process today as it was ten years ago. Of course OCR was not available on the desktop a decade ago, so despite the limited number of fonts that can be read, that's an improvement.

Graphical input was once the biggest problem for electronic publishing. Today graphics programs such as Illustrator and FreeHand are widely accepted by graphic artists, as SuperPaint and MacDraw were before them. Adobe Illustrator 88's new tracer tool merits special note. With it we can perform raster-to-vector conversion on images scanned into an encapsulated PostScript (EPS) file. This is a breakthrough. Sure, drawing freehand curves with bezier fitting is neat, but that has been available on larger computer systems for many years. What's new is the tracer's ability to pick out shapes from any black-and-white scanned image and fit beziers to them. The artists and designers who work on *Macworld* have made the transition from MacPaint to Illustrator, and soon will move on to Illustrator 88.

Clip art, already a large segment of the graphics market on the Macintosh, has grown to include EPS-format clip art, such as that from T/Maker. Art in that format is scalable and of higher quality than in the previous bitmapped collections. The number of disks has grown, and now several other companies, such as Multi-ad, Micro Dynamics, and Metro, are offering CD ROM clip art disks.

Most people don't recognize that the newspaper industry thrives on clip art—that's where all those supermarket ads come from. And putting that stuff in digital form for traditional users, who can retrieve and scale it, is no doubt a boon. At *Mac-*

world we use no clip art, so the emergence of PostScript-format graphics libraries has had little impact on us. When 35mm slide libraries become available on CD ROM, then we'll probably have a use for clip art. At present, magazine designers seem to disparage the line art materials many newspapers love.

Scanners that capture photographs and line art are now practical tools, if not in our own office. In fact we do use them at *Macworld*, but mostly to demonstrate scanner capabilities in pertinent feature articles. Two new scanners, those from Truvel and Sharp, capture color, flat, reflective art up to B size (11 by 17). Two others, the Barneyscan and Howtek's Scanmaster, digitize 35mm slides and can perform some image-processing effects on the pictures. These scanners bring us into the realm of technology previously affordable only by major national magazines with millions of readers.

Our art department has a skeptical view of its own DTP capability at present, which is understandable. The learning curve on the new technology is enormous and most companies aren't willing to provide time for training and implementation. Furthermore, suppliers of color separations are viewed as the professionals who help keep the quality of color work high. But I'm excited, because when we use today's DTP software (Quark XPress is the leader here), we can actually see color magazine pages laid out. Then the four-color art and the text can be edited.

(continues)

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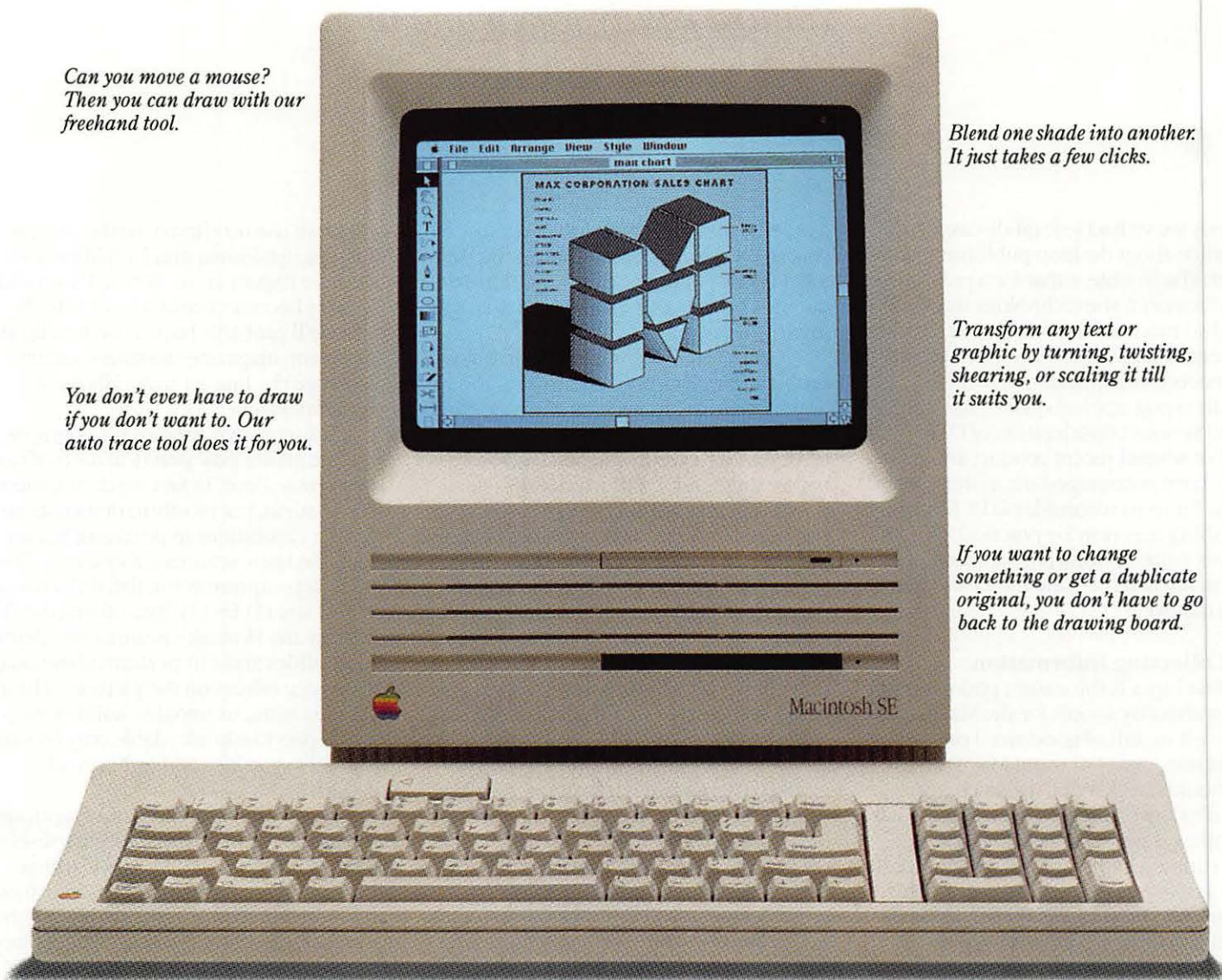
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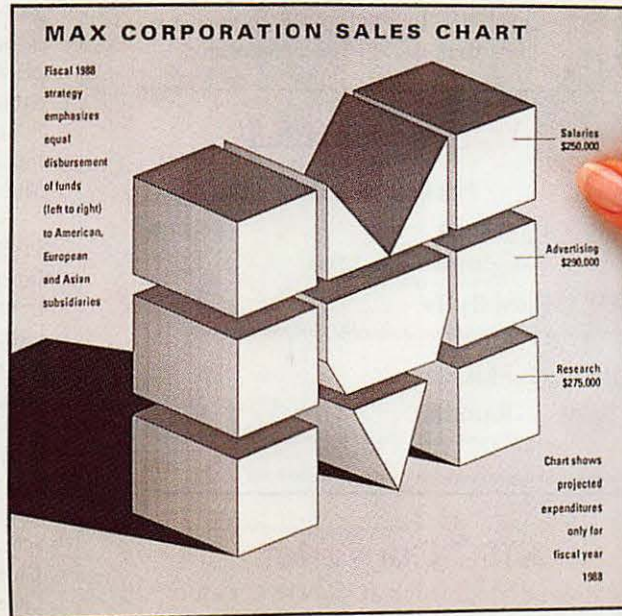
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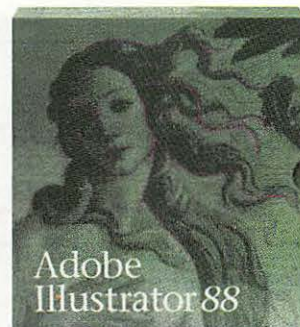
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Commentary/Jerry Borrell

Editing Page Elements

Electronic art creation, text editing, and page composition have long been within the realm of publishing leaders like Dai Nippon Screen, Scitex, Crossfield, and Hell. These vendors write software for large image-processing workstations produced by firms such as Comtal and De-Anza—workstations that cost hundreds of thousands of dollars.

Today the functionality of these systems is moving onto the Mac II. Scanners or CD ROMs allow photographic input. The 24-bit graphics boards from RasterOps and SuperMac (and eventually, Apple) allow photographic images to be displayed. Admittedly, systems such as the Crossfield and Scitex support 32-bit color, but TrueVision has demonstrated such a board for the Mac II.

The next step is editing the image. Presently only a version of PixelPaint has been demonstrated at 24 bits, but products from other vendors are shortly to follow. Letraset's Image Studio may be extended to color. Silicon Beach's Digital Darkroom will provide designers with a scrapbook of image-processing functions (contrast, edge enhancement, filters, posterizations) that can be extended to color.

I would be remiss not to mention some of the illustration products—Illustrator 88, FreeHand, PixelPaint, and LaserPaint—that can be used for more than two-, three-, or four-color printing. Those programs have licensed the Pantone color system and can output the cyan, yellow, and magenta files used to create color for offset printing. The real advantage now is their ability to print a cyan/yellow/magenta/black file on film with a laser printer, to produce a proof of the illustration at quality that nears the Chromalin standard used throughout the publishing trade.

A step beyond this is the ability to produce color separations on a Linotronic in the same fashion. For some applications this may produce separations suitable for printing, but it can't replace process-color separations for *Macworld*.

The connection to laser film plotters is still a bit flaky, but that's coming too. LaserPaint, for example, has announced a direct interface to the Scitex, as has Quark. Separations suitable for *Macworld* can be made by sending files direct to film. OK, we still have to proof the separations at the printer, but other magazines have accepted that responsibility for a decade now.

(continues)

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It's BackPac time!

Introducing the
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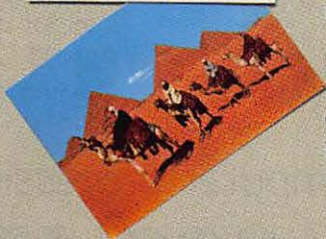
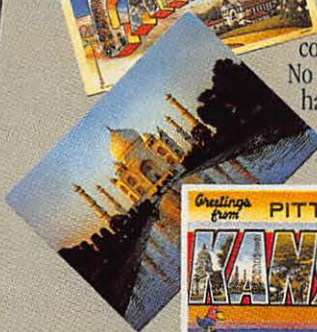
Now that Apple has dramatically lowered the price of a Macintosh Plus, you can afford to buy it *and* Jasmine's radical new BackPac, the amazingly quiet, quick, and very powerful 40 megabyte hard disk drive that everyone's talking about.

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*California residents add 6.5% sales tax.
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Jasmine

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Jasmine Technologies, Inc. 555 DeHaro Street, San Francisco, California 94107

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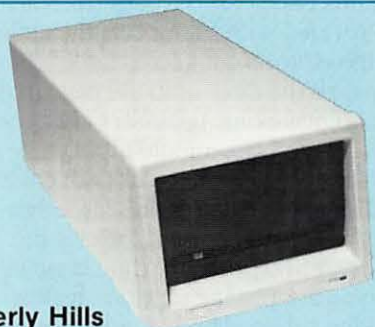
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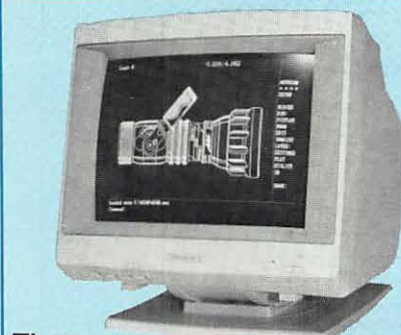
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Editing the Page

Having finished an article, we combine all of its elements on a page. That's not as tough a problem for us at *Macworld* as in some other places, because much of the magazine's editorial content—news, features, and reviews—runs on entire pages, uninterrupted by fractional advertising.

For the news, reviews, and departments sections, we have the advantage of standard layouts. Our art department can design templates for the editors, enabling them to make a rough layout of an article by flowing text and perhaps graphics elements into the template. I'm not advocating editors becoming artists—those discussions border on religious wars at some publishing houses—but both editor and designer could work more effectively if there were some common starting point. The editor would quickly learn five pictures won't fit into a four-page department.

Charts, such as our comparison tables (for example, the table in "Looking at Lasers" in this issue), are a wonderful starting point. Provided with a template, the author passes the editor a completed table. The editor pastes the table onto the page in the article and makes any necessary changes (length, content, last-minute input). The art department overlays the chart with color or shading, sizes it, and makes any other changes. The designer then looks at the entire article and performs thumbnail edits: positioning art, placing captions against art, making subhead breaks, adjusting the line breaks in text or headlines. Such adjustments, which give the piece a finished look, are functions that XPress and Scoop perform very well.

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At this point in our future DTP scenario we have all of our news, features, departments, and reviews created, but they're sitting in disk files. Now for the tough part, combining them with the advertising pages. There really is no DTP software designed to handle all of that. Three hundred pages of editorial and advertising have to be organized manually. The departments and news are apportioned in the front and back of the magazine; the features and reviews sit in the middle of the magazine, in the editorial well. Three hundred pages of material. In Quark XPress we could lay it out by leaving blank spaces for the advertisements. But even XPress is insufficient to fully automate this task.

(continues)

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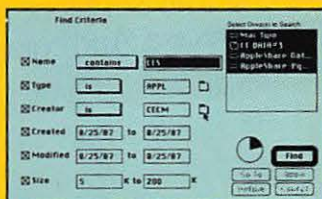
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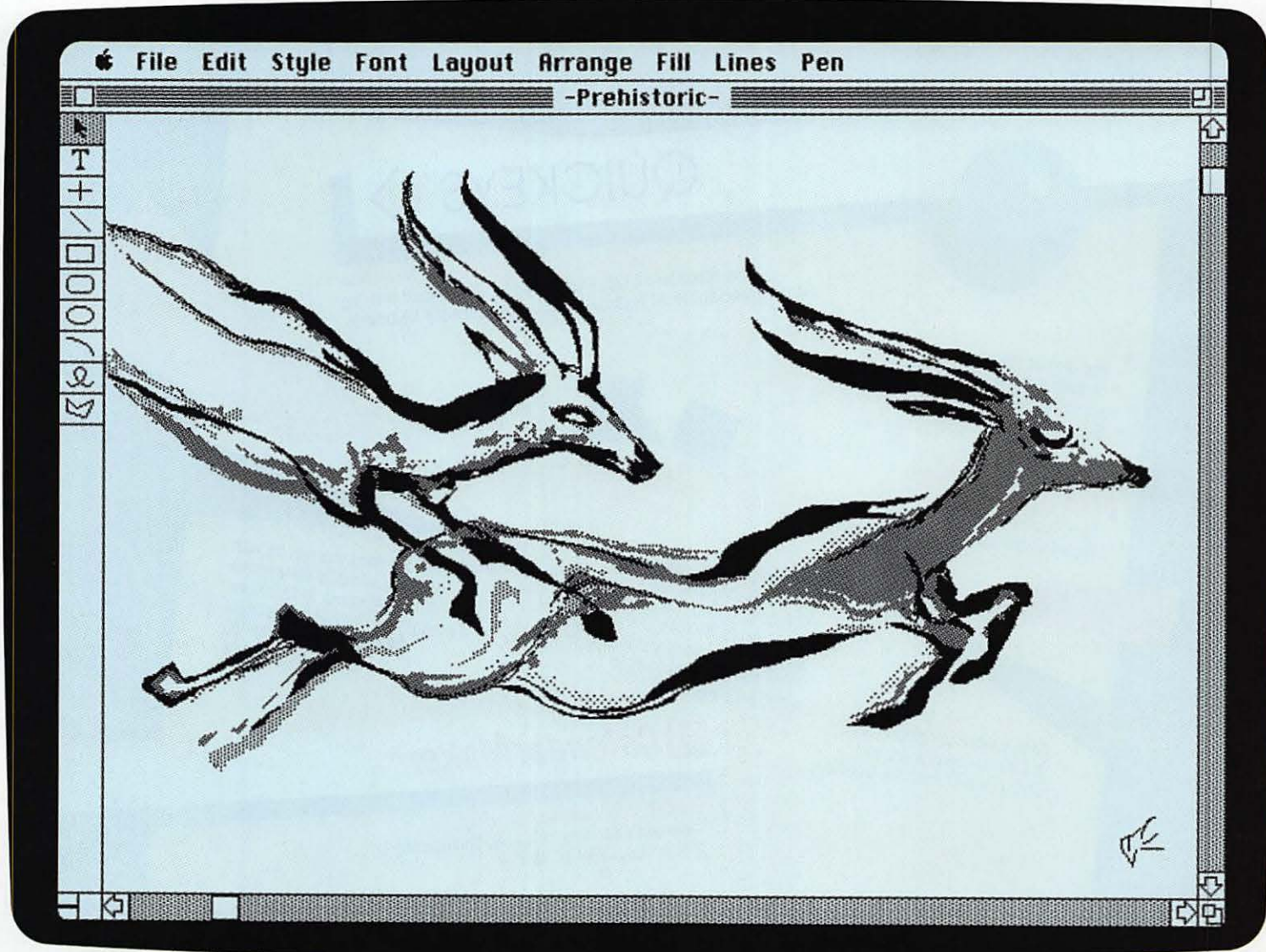
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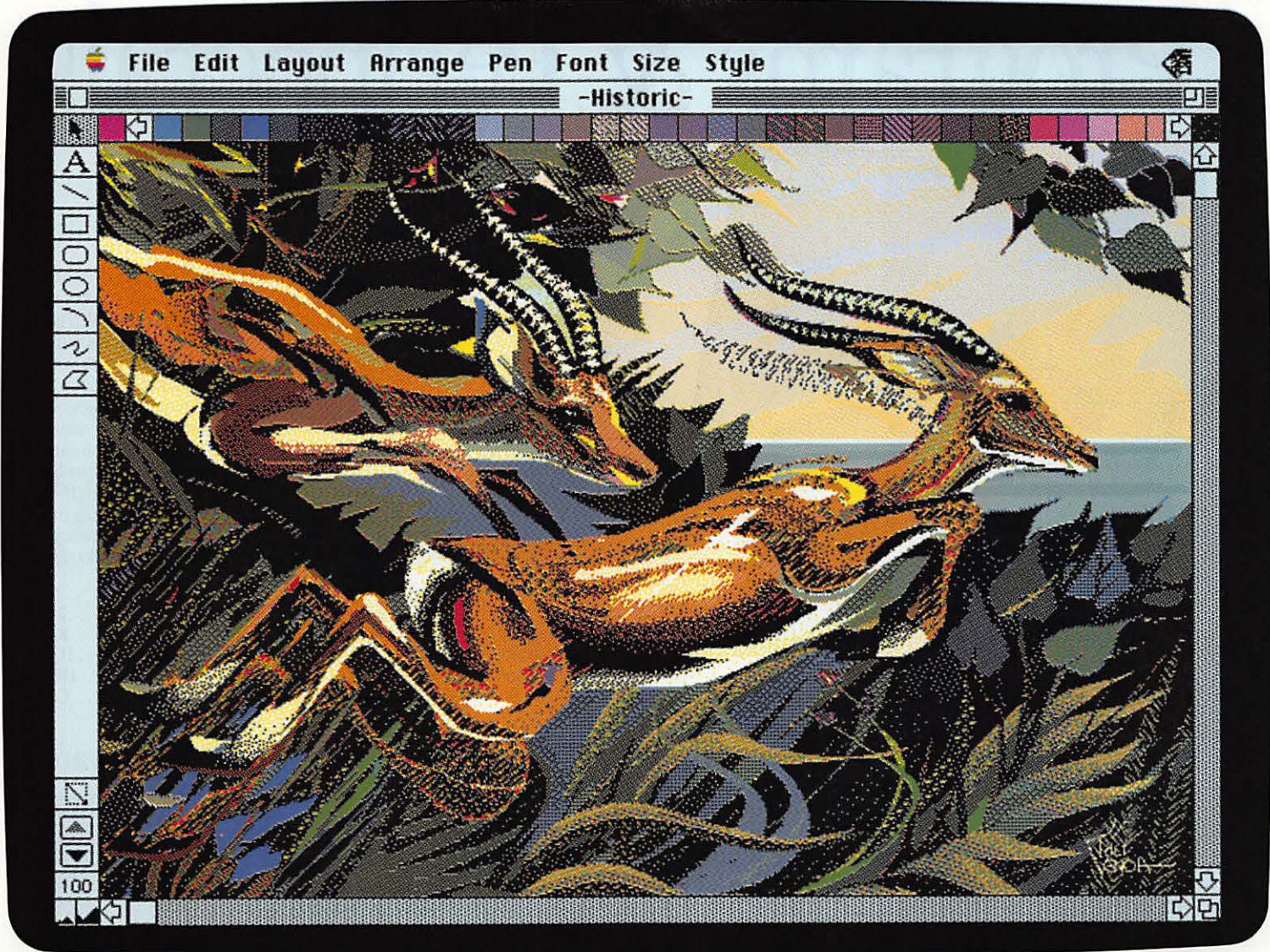
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And you can customize patterns, lines, dashes, and even hone your own arrowheads.

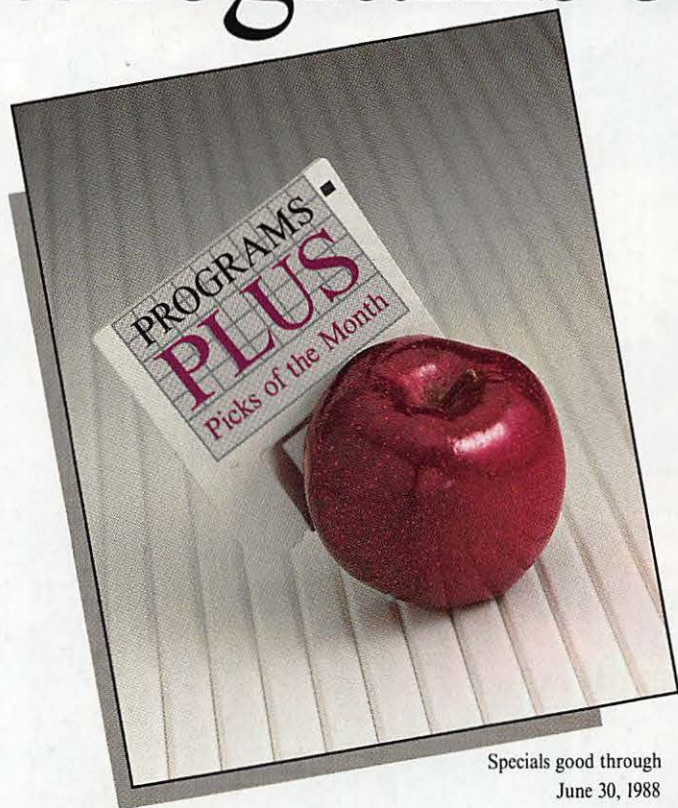
Finally, MacDraw II offers over 16,000 different color patterns on the Macintosh II. And drawings like the one above can be reproduced on a color plotter or printer. You can even do color separations.

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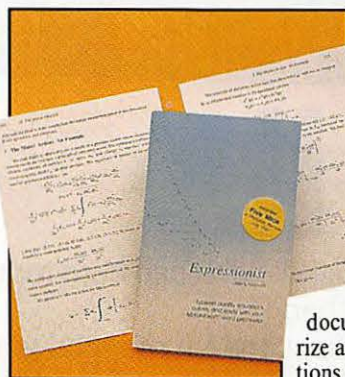
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Specials good through
June 30, 1988

Expressionist by Allan Bonadio Assoc.



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Magazine awarded FIVE MICE to this powerful yet simple program!

Expressionist 46.

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MacBottom SCSI Hard Disk Drives by PCPC



MacBottom SCSI Drives arrive completely formatted with easy-to-use software including a print spooler, a floppy disk duplicator and a backup program. **MacBottoms** come with everything you need to get started including cables, terminators, and an additional SCSI port. You can even get a Hayes compatible 1200 baud modem built right in. **MacBottoms** weigh less than five pounds and measure just two inches tall but no other hard disk stacks up!

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"Draw it again, Sam" 89.

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Affinity Microsystems Tempo II	94.	Imagine Software	
AffiniFile	46.	Smart Alarms & Appointment Diary	35.
Borland SideKick V2.0	63.	Multi-User Appointment Diary	
Cortland		with Smart Alarms	89.
Top Desk	32.	Solutions, International	
Greene, Inc.		SmartScrap & The Clipper	35.
QuickDex 1.4	32.	Symmetry HyperDA (Req. 512K)	38.

Languages

Apple Computer MacPascal	99.	Microsoft	
Borland Turbo Pascal	63.	Microsoft Basic Interpreter 3.0	65.
Turbo Pascal Numerical Methods	65.	Microsoft Basic Compiler 1.0	127.
Turbo Pascal Tutor	46.	THINK Technologies	
Consulair		Lightspeed C	95.
Macintosh 68000 Development System	59.	Lightspeed Pascal	65.
Mainstay		CAPP's for Lightspeed C or	
V.I.P. (Visual Interactive Programming)	79.	CAPP's for Lightspeed Pascal	49.

Communications Software

Apple Computer MacTerminal	99.	Software Ventures	
Compuserve Compuserve Starter Kit	24.	Microphone II (Includes Glue)	209.
DataViz MacLink Plus with Cable	145.	Think Technologies, Inc.	
Freesoft Red Ryder V10	49.	InBox-Starter Kit V2.0	
Palantir InTalk V3	99.	(3 Personal Connections)	199.

to Polish Up Your Mac...

MacKids Educational Programs by Nordic Software

MacKids is a complete series of twelve quality educational software products for the Mac specifically designed to teach and entertain kids. Whether your children are preschoolers or young adults, there's a *Mac Kids* package that will give them the learning edge.

Preschool Disk 1 (3-7), Preschool Disk 2 (3-7), CoinWorks (4-12), ClockWorks (4-10), Early Elementary 1 (6-9), Lemonade Stand (6-16), FlashWorks (6-adult), Naval Battle (6-adult), Word Search (6-adult), Alphabetizer (7-adult), EarthWorks (10-adult), or Bodyworks (10-adult).

Each Program 29.



A+ Mouse and A+ Mouse ADB by Mouse Systems



The **A+ Mouse** is the most reliable mouse available for your Macintosh. It has an MTBF (Mean Time Between Failure) rating in excess of 30 years, and is the only mouse available with a lifetime warranty. This is because, as an Optical Mouse, it has absolutely no moving parts to breakdown! The **A+ Mouse** uses a beam of light reflecting off a mirror-like pad to provide the most accurate and sensitive pointing device now available, with the ability to measure even the slightest hand movement.

Order the **A+ Mouse** today, in either the normal or new ADB interface, and get the mouse with the 3 best features any mouse could offer, nothing to break, nothing to clean, and nothing to worry about.

A+ Mouse 67.
A+ Mouse ADB 87.

Smash Hit Raquetball II by Primera Software

Smash Hit Racquetball II is the ultimate one or two player racquetball game available for the Macintosh. This is the winner of the MacUser five mouse award for its speed of play and the audio/visual experience players enjoy. You can tune up your corner kill shots against the computer or get revenge against your favorite human opponent via a modem or Appletalk connection or even through a direct connection. **Smash Hit Racquetball II** provides digitized sound, over 270 frames of animation, four ability levels, instant replay and more!

Smash Hit Racquetball II 21.



Mac Sqz! by Turner Hall Publishing



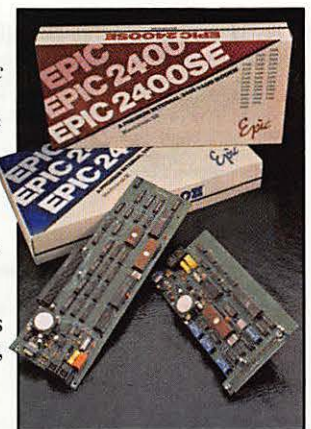
Mac Sqz! is a combination desk accessory and application for use with Microsoft Excel. The major feature of this package is the ability to compress Excel data files, data folders or even entire Excel data disks by as much as 95%, with 0% effort on your part. It can be set up to automatically reduce your spreadsheets when you save them and expand them back to their original size when they are opened, with absolutely no loss of data.

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Mac Sqz! 49.

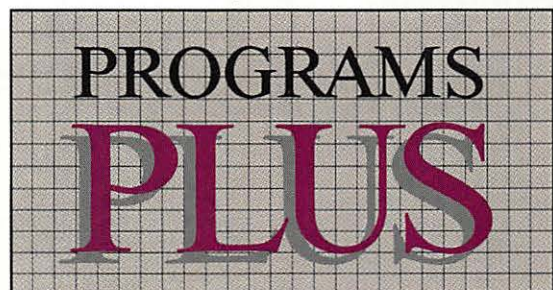
Epic Modems by Epic Technology

Epic Technology offers a full line of internal and external multi-speed modems for any Macintosh. The **Epic 2400II** is an internal 2400 baud modem for the Macintosh II, and the **Epic 2400SE** is their offering for an internal 2400 baud modem for the Mac SE. Their **Epic 2400 Plus** is an external 2400 baud modem for use with any computer. All **Epic** modems are produced here in the U.S.A. and come with a full five year warranty. Their popular features include, Hayes compatibility, data to voice switching, audio monitor, redial on busy, DTMF/pulse or mixed dialing, and full self test modes. Call today and inquire about **Epic's** full line of competitively priced modems.



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Epic 2400SE 249.
Epic 2400 Plus 155.

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Disk Drives/Hard Disks/Upgrades

AST Research		SCSI Interface/Port	85.
Mac86 Co-Processor (Mac SE)	419.	MacSnap Toolkit (torx driver, opener & grounding set)	15.
Mac286 Co-Processor (Mac II)	1049.	Everex Emac 20D (20Mg Hard Disk)	520.
Central Point		Emac 20 Deluxe	585.
Central Point 800K External Drive	185.	MacMemory, Inc.	
Copy II PC Deluxe Option Board	129.	Turbo SE (16 Mhz 68000 Accelerator for the Mac SE)	399.
CMS MacStack 20 Ext Subsystem (MacPlus/SE/II)	569.	Motorola 68881 (Math Coprocessor for Turbo SE)	349.
MacStack 60 Ext Subsystem (MacPlus/SE/II)	849.	MaxPlus Mega (2MB Upgrade with 1MB Chips for MacPlus)	345.
Pro-SE 40 I or R	839.	Personal Computer Peripherals	
Pro-SE 100 I or R	1489.	Beige or Platinum Color, Optional Built-In Modems Available.	
Pro II 43 Internal	649.	MacBottom HD-21 (20+MB SCSI Hard Disk)	Special 749.
Pro II 102 Internal	1189.	MacBottom HD-32 (32MB SCSI Hard Disk)	Special 879.
60MB Tape Backup (MacPlus/SE/II)	739.	MacBottom HD-45 (45MB SCSI Hard Disk)	Special 1139.
Cutting Edge Cutting Edge 800K Drive	175.	MacBottom HD-70 (70MB SCSI Hard Disk) Plat only	Special 1395.
Cutting Edge Wedge XL 30 Plus SCSI Hard Drive	649.	MacBottom IHD-144 (Mac II)	2195.
Cutting Edge Wedge XL 45 Plus SCSI Hard Drive	829.	WSI (connects HD-20 SCSI)	295.
Dove Computer Corporation		Rodime Rodime 20 Plus (External 20MB SCSI)	629.
MacSnap 524 (512K to 1MB)	165.	Rodime 201 Plus (Internal 20MB for MacPlus)	629.
MacSnap 524E (512E to 1MB)	145.	Rodime 45 Plus (External 45MB SCSI)	939.
MacSnap 524S (512E to 1MB w/SCSI)	219.	Rodime 450RX (Internal 45MB for Mac SE & Mac II)	829.
MacSnap 548 (512K to 2MB) or 548E (512E to 2MB)	359.		
MacSnap 548S (512E to 2MB w/SCSI)	429.		
MacSnap Plus 2 (MacPlus to 2MB Non Expandable)	265.		
MacSnap 2S or 2H (1MB to 2.5MB for MacPlus/SE)	449.		
MacSnap 4S or 4H (1MB to 4MB for MacPlus/SE)	879.		

Laser Printers & Digitizers

AST Research TurboLaser P/S	3559.	Summagraphics	
TurboScan (Sheetfeed model)	1199.	MacTablet 12x12 size	379.
TurboScan (Flatbed model)	1329.	ThunderWare	
Impulse Impulse (MacNifty) Audio		ThunderScan V4.0 with Power Port (Mac 512K, 512K Enhanced, MacPlus, and Macintosh SE)	199.
Digitizer V2.0 w/Soundwave	149.	Mac II Power Accessory	42.
Koala Technologies Corp.			
MacVision (Digitizer)	169.		

Accessories

Abaton ProPoint (ADB TurboMouse for Mac SE & Mac II)	119.	Polarizing Filter	33.
Bach-Tech Fanny Mac (Beige or Platinum)	65.	Printer Muffler 80	37.
Cambridge Automation Numeric Turbo Central Products	99.	Printer Muffler 132	51.
MacOpener (All In One Mac Tool)	16.	Masterpiece 400	63.
Curtis Manufacturing		System Saver Mac (Beige or Platinum)	64.
Diamond-Surge Suppressor-SP-1	29.	Super Base	34.
Emerald-Surge Suppressor-SP-2	36.	System Saver SE	51.
Ruby-Surge Suppressor-SPF-2	55.	Masterpiece Mac II	105.
Sapphire-Surge Suppressor-SPF-1	47.	A/B Box (MacPlus Only)	63.
Cutting Edge Cutting Edge		Turbo Mouse (Reg. or ADB)	82.
EADB-105 (Mac SE & Mac II)	139.	Lightgate Felix (Second Generation Pointing Device)	99.
DataDesk MAC-101 Keyboard/Beige (128k/512k & MacPlus)		Mouse Systems	
MAC-101 ADB Keyboard/Platinum (Mac SE & Mac II)	139.	A+ Mouse (MacPlus)	Special 67.
Ergotron		A+ ADB Mouse (Mac SE/Mac II)	Special 87.
MacTilt or MacTilt SE (Platinum Color)	68.	Moustrak MousePad 7" x 9" Size	8.
Mouse Cleaner 360°	15.	MousePad 9" x 11" Size	9.
I/O Design		Moustrak L/F (Low Friction)	9.
Mac Luggage in Navy or Platinum Gray	69.	Nuotech EasyNet (Specify Din 8 or DB-9)	27.
Macinware Plus Carrying Case	79.	Orange Micro Grappler C/Mac/GS (Parallel Interface for the Mac)	84.
Macinware SE Carrying Case	79.	Grappler L/Q (Parallel Interface for 24 Pin & Laser Printers)	99.
ImageWare II Carrying Case	49.	Orchid Technology ColorVue SE Ribbons Unlimited	505.
Kalmar Designs		Available in Black, Blue, Brown, Green, Orange, Purple, Red, Yellow, Silver & Gold	
Teakwood Roll-Top Disk Cases:		ImageWriter Ribbon	4.
Micro Cabinet (holds 45 disks)	14.	ImageWriter Black 6-pack	20.
Double Micro Cabinet (holds 90 disks)	20.	ImageWriter Rainbow Pack (6 Colors)	20.
Triple Micro Cabinet (holds 135 disks)	27.	ImageWriter II-Four Color Ribbon	9.
Kensington External Disk Drive Cover	8.	Silicon Comforts MacChimney (Very Effective Cardboard Laminated Convection Cooling Device)	16.
Extra Long ADB Keyboard Cable	25.	SoftStyle MacEnhancer	165.
Macintosh II Stand	30.	The Madison Line	
Macintosh II Monitor Cable Extension	23.	Professional Series Carry Cases In Black Ballistic Nylon	
Mouse Pocket (Reg. or ADB)	8.	Mac(Plus) Carry Case	79.
Mouseway (Mousepad)	9.	Mac SE Carry Case	99.
ImageWriter or ImageWriter II Cover	9.	ImageWriter I (II) Carry Case	75.
Macintosh Plus/SE Dust Cover	17.	TOPS Tops Tele-Connector DB-9	39.
Mouse Cleaning Kit w/Pocket	20.		
Disk Drive Cleaning Kit	22.		
Tilt/Swivel	23.		
Universal Copy Stand	34.		
Apple Security Kit			

Blank Media

Single Sided 3 1/2" Diskettes		Double Sided 3 1/2" Diskettes	
BASF 3 1/2" SS/DD Disks (box of 5)	8.	BASF 3 1/2" DS/DD Disks (box of 5)	9.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Bulk (Sony) 3 1/2" DS/DD Disks (10)	16.
Sony 3 1/2" SS/DD Disks (box of 10)	13.	Centech 3 1/2" DS/DD Color Disks (10)	19.
Centech 3 1/2" SS/DD Color Disks (10)	16.	Sony 3 1/2" DS/DD Disks (box of 10)	18.
Fuji 3 1/2" SS/DD Disks (box of 10)	13.	Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Maxell 3 1/2" SS/DD Disks (box of 10)	13.	Maxell 3 1/2" DS/DD Disks (box of 10)	20.
Verbatim 3 1/2" SS/DD Disks (box of 10)	13.	Verbatim 3 1/2" DS/DD Disks (box of 10)	19.
3M 3 1/2" SS/DD Disks (box of 10)	14.	3M 3 1/2" DS/DD Disks (box of 10)	20.
C.Itoh Color Disks SS/DD (box of 10)	22.	C.Itoh Color Disks DS/DD (box of 10)	25.

Modems

Epic Epic 2400 Int. SE (Hayes Compatible)	Special 249.	Prometheus	
Epic 2400 Int. Mac II (Hayes Compatible)	Special 249.	Promodem 1200 (Hayes Compatible)	239.
Epic 2400 Plus Ext (Hayes Compatible)	Special 155.	Promodem 2400 (Hayes Compatible)	309.
Everex Emac 2400 Baud	225.	Mac Pack w/Procom M and Cable (Specify Mac or MacPlus)	49.
Hayes Microcomputing		Shiva Net Modem V1200	369.
Smartmodem 1200	299.	Net Modem V2400	489.
Smartmodem 1200 Mac w/Smartcom II & Cable (MacPlus)	359.	Net Modem X232	309.
Smartmodem 2400	449.	Net Bridge	309.
Migent Migent Pocket Modem (ext. 300/1200 Baud)	115.	Supra Corporation Supra Modem 2400	154.
Novation Novation Parrot 1200	93.	U.S. Robotics	
		Courier 1200 (Hayes Compatible)	199.
		Courier 2400 (Hayes Compatible)	349.
		Courier 2400E (Hayes Compatible)	379.
		Courier HST 9600 (Hayes Compatible)	689.

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DataBase Management

Activision Focal Point	59.	Fox Software Fox Base Plus	214.
Business Class or City to City	30.	Fox Base Runtime	162.
Reports for Hypercard	62.	Microsoft Microsoft File 1.05	120.
Acus 4th Dimension	559.	Nantucket Software	
Apple Computer HyperCard	44.	McMax (dBase III Compatible)	178.
Ashton Tate dBASE Mac 1.0	295.	Nashoba Systems FileMaker Plus	149.
Blythe Software Omnis 3 Plus/Express	279.	Odesta Double Helix II	339.
Borland Reflex Plus	165.	ProVUE Development OverVUE 2.1E	149.
Chang Laboratories		Software Discoveries	
C.A.T. Contacts*Activities*Time	229.	RecordHolderPlus	45.

Business Software

Bravo Technologies MacCalc	83.	Capture	38.
Clarix MacProject II	Call	Micro Planning Software	
Cricket Software Cricket Graph	119.	Micro Planner Plus	299.
Cricket Presents...	289.	Microsoft	
Pict-O-Graph	105.	Microsoft Works 1.1 with Spellswell	189.
Deneba Software Comment	59.	Microsoft Multiplan 1.1	120.
Xtra 2.0	109.	Microsoft Mail 1-4 users	195.
Layered Notes For Excel or		Microsoft Excel 1.04	239.
Microsoft Works (each)	41.	Microsoft PowerPoint	239.
Legisoft/Nolo Press WillMaker 2.0	30.	North Edge Software Timeslips III	119.
Lotus Jazz 1A	189.	Satori Software Bulk Mailer 3.0	79.
Lundeen & Associates		Bulk Mailer Plus	195.
WorksPlus Commands	62.	Legal Billing	369.
MacroPac International		Legal Billing II	539.
101 Macros For Excel	49.	Project Billing	409.
Mainstay Think 'n Time	61.	Shana Enterprises Fast Forms	72.
Mac Flow 2.0 or Mac Schedule	115.	Turner Hall Publishing MacSQZ! Special	49.

Word & Outline Processors

Clarix MacWrite 5.0	Call	Microsoft Write	114.
Living Videotext		Symmetry Acta V2.0	36.
More 1.1C (Color Version)	175.	T/Maker Company	
Microsoft Microsoft Word 3.0	239.	WriteNow V2.0	98.

Spelling & Grammar Checkers

Aegis Development		Lundeen & Associates	
Doug Clapp's Word Tools	42.	WorksPlus Spell 1.1	46.
A.L.P. Systems MacProof 3.0		Microlytics, Inc.	
(Requires MacPlus)	115.	Word Finder (Synonym Finder)	35.
Batteries Included Thunder! 1.23	31.	Sensible Software Sensible Grammar	57.
Deneba Software Spelling Coach 3.0		Working Software, Inc.	
(Webster's/Medical/Legal/Hyphenation)	54.	Spellswell 2.0	42.
Spelling Coach 3.0 Professional		Spellswell Medical Dictionary	55.
(Adds Definitions & Thesaurus)	109.	Spellswell Legal Dictionary	24.
Coach Merriam Webster's Thesaurus 2.0	36.	Lookup (Makes Spelling Suggestions)	29.

Desktop Publishing

Addison-Wesley TEXTures	279.	Postcraft International, Inc.	
Aldus Corporation PageMaker 3.0	475.	Laser FX	115.
Allan Bonadio Associates		Laser FX Font Packs #1-8 (each)	30.
Expressionist 1.1	Special 46.	Quark, Inc. QuarkXPress V2.0	Call
Ann Arbor FullWrite Professional	169.	Solutions, International	
Boston Publishing Systems		Super Glue	52.
The MacPublisher III	119.	Target Software Scoop	Call
Letraset Ready, Set, Go! 4.0	279.	Word Perfect Corporation	
ImageStudio	279.	Word Perfect	189.

Accounting Packages

Aatrix Software Aatrix Payroll V3.0	129.	Rags to Riches GL, AR, or AP	120.
Chang Labs		Layered Insight One Write	189.
Free Inventory or Professional Billing		MECA	
with Purchase of 3-Pak!		Managing Your Money	129.
New Enhanced Version III Modules!		Migent In House Accountant	99.
Rags to Riches 3-Pak 3.1		Monogram	
(GL/AR/AP)	289.	Business Sense	279.
Professional 3-Pak		Dollars & Sense 4.0	81.
(GL/Professional Billing/Payables)	359.	Peachtree	
Retail Business 3-Pak		Back To Basics 3-Pak (GL/AR/AP)	139.
(GL/AP/Inventory Control)	359.	Survivor Software	
Inventory Control 2.6 or		MacMoney 3.0	
Professional Billing 2.6	239.	(Enhanced Version)	62.

Statistics & Math Packages

BrainPower		Borland Eureka! The Solver	129.
StatView 512 Plus	175.	Systat Systat 3.1 (Specify Mac 512K,	
Math View Professional	145.	MacPlus, or Mac II)	459.

Graphics Software

ABA Software		Micro: Maps MacAtlas Paint Version	32.
Draw It Again Sam...	Special 89.	MacAtlas Professional	129.
Adobe Systems Adobe Illustrator 88	379.	Miles Computing	
Aldus Freehand	389.	Mac The Ripper, Orchestra of Fonts,	
Altsys Corp. FONTastic Plus	47.	People-Places-Things, or	
Fontographer 2.2	239.	Taking Care of Business (each)	27.
Ann Arbor Softworks Full Paint	49.	Mindscape GraphicWorks 1.1	84.
Broderbund Print Shop	36.	Olduvai Software Post-ART (3-Disk Set)	35.
Casadyware Fluent Fonts 2.0 (2-Disk Set)	26.	Silicon Beach Software SuperPaint	79.
Fluent Laser Fonts Vol. 1-18 (ea)	45.	Digital Darkroom	107.
Clarix MacPaint 2.0	Call	Silicon Press	41.
Computer Friends Modern Artist	109.	Solutions International	
Deneba Software Canvas 1.0		The Curator (Catalog Your Art)	79.
(Includes Desk Accessory)	109.	Springboard Certificate Maker	24.
Canvas DA	57.	SuperMac Software Pixel Paint	259.
Dubl-Click Software		Symmetry PictureBase 1.2	58.
World Class Fonts! (Both Volumes)	36.	T/Maker	
WetPaint (Both Volumes)	36.	Click Art Letters I, Letters II, Personal	
Enzan-Hoshigumi USA		Graphics, Publications, Effects,	
MacCalligraphy 2.0	109.	Business Image, or Holidays (each)	28.
Japanese Clip Art Scroll 1		Christian Images	35.
"Heaven" or Scroll 2 "Earth"	52.	Click Art EPS Illustrations	79.
Japanese Clip Art "Borders" Scroll	69.	Click Art Laser Fonts: Plymouth,	
Foundation Publishing Comic People	25.	Bombay, or Seville (each)	45.
Comic Strip Factory	45.	Unison World Chest Top Publishing	34.
Macromind Videoworks II	118.	Zedcor DeskPaint 1.0	69.

CAD Products

Challenger Software		Enabling Technologies Easy 3D	79.
Mac 3D (Enhanced Version 2.0)	119.	Innovative Data Design MacDraft 1.2B	149.
Clarix MacDraw	Call	Silicon Beach Software Super 3D	159.
Cricket Software Cricket Draw	169.	Super 3D Enhanced (Mac II)	249.

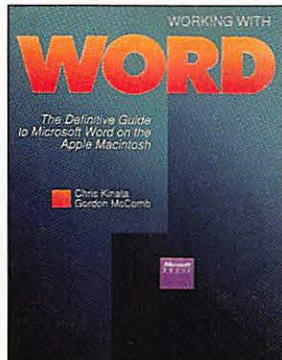
Educational/Creative Software

Baron's Baron's SAT	35.	Great Wave Software TimeMasters	22.
Bogus Productions Studio Session	52.	KidsTime	26.
Broderbund Jam Session	30.	CrystalPaint	49.
Geometry, Calculus or Physics	60.	Concertware+ 4.0 or American Discovery	39.
Type!	31.	Concertware+ MIDI 4.0	79.
Where in the World is Carmen San Diego	25.	Hayden	
Coda Mac Drums	26.	Score Improvement System for the SAT	58.
Compu-Teach Once Upon A Time	23.	Learning Company Reader Rabbit	34.
Stepping Stones Level I or Level II	23.	Mindscape Perfect Score SAT	
Davidson & Associates Speed Reader II	39.	w/The Perfect College	46.
Math Blaster or Word Attack!	27.	Nordic Software MacKids	
Electronic Arts		Educational Programs (each)	Special 29.
Deluxe Music Construction Set V2.0	61.	Rubicon Publishing	
1st Byte/Electronic Arts		Dinner at Eight-Silver Palate Bundle	51.
Kid Talk, Speller Bee,		Simon & Schuster Typing Tutor IV	35.
First Shapes, or Math Talk	32.	Speed Reading Tutor IV	32.
MathTalk Fractions, First Letters &		Springboard Early Games for	
Words, or Smoothtalker	32.	Young Children or Easy as ABC	28.

Game Software

Access World Class Leader Board Golf	24.	Business Card Maker	36.
Accolade Hard Ball	23.	Microsoft Flight Simulator 1.02	32.
Activision Firepower	16.	Miles Computing Inc.	
Shanghai or Romantic Encounters	24.	Downhill Racer or Quintette	24.
Tass Times in Tonetown	21.	Harrier Strike Mission II	
Might and Magic	37.	or The Fool's Errand	27.
Artworx Bridge 5.0	22.	Mindscape Balance of Power,	
Avalon Hill Mac Pro Football	29.	Crossword Magic or Citadel	30.
Baudville Award Maker Plus	29.	Deja Vu: A Nightmare Comes True	30.
Broderbund Ancient Art of War	27.	King Of Chicago, or Shadowgate I	30.
Bullseye Software		Defender of the Crown, Siboot	
Fokker TriPlane or Ferrari Grand Prix	32.	or The Uninvited	30.
Electronic Arts Ogre	30.	Practical Computer Applications	
ChessMaster 2000	29.	MacGolf 2.0 or MacRacquetball V2.0	35.
Starfleet I	37.	MacCourses	34.
Venture's Business Simulator	47.	Primera	
Patton vs Rommel or Scrabble	27.	Smash Hit Racquetball II	Special 21.
One-On-One, Pinball Construction Set,		Sierra On-Line Space Quest	30.
Seven Cities of Gold or SkyFox (each)	15.	King's Quest I, II, or III (each)	30.
EPYX Winter Games		Leisure Suit Larry	24.
or Sub Battle Simulator	24.	Police Quest	35.
Hayden Software Sargon III	29.	Silicon Beach Software World Builder	41.
Infinity Software, LTD. Go	26.	Enchanted Scepters	21.
Infocom Leather Goddesses of Phobos,		Dark Castle or Apache Strike	27.
Nord & Bert, Plundered Hearts,		Simon & Schuster	
or Sherlock (each)	24.	Star Trek (The Kobayashi Adventure)	24.
Beyond Zork	30.	Sir-Tech Mac Wizardry	35.
Hitchhiker's Guide to The Galaxy	18.	Spectrum Holobyte Solitaire Royale	19.
Science Fiction Classics	35.	Sphere, Inc. GATO, Orbiter, or Falcon	26.
Zork Trilogy	42.	XOR Software NFL Challenge	64.
Intracorp Bumper Sticker Maker	35.	Pro Challenge	31.

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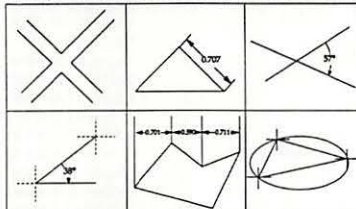
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Circle 77 on reader service card

Commentary/Jerry Borrell

Our interactive editing programs also lack the batch pagination features that would make changes in hundreds of pages possible—you know, when a feature has to be pulled at the last minute because a company decides it has to delay the announcement of a new product, and we already have an article prepared. Then we have a hole and lots of attendant problems. Or when a partial-page ad on page 24 drops out just before we go to press and we have to repaginate the entire magazine. I wish I could say Interleaf could handle these kinds of problems for a magazine, but I would be doing a disservice to a fine product. If we published books, Interleaf's batch-oriented features would do it.

Printing a Proof

All done, right? No. Many sets of eyes need to see a final proof. Just produce proofs on a Dataproducts printer? Even with our unusual page size, we would be able to view a complete single page or a two-page spread without gutters. But that wouldn't reveal problems with color. So send out the single pages to a QMS-Mitsubishi PostScript color thermal printer? Even at \$25,000 it would be tempting; the problem is that the proof printer ought to be able to imitate what the printing press will produce with process inks, not just reproduce the colors we see on the screen. Our designers would have to learn to translate or adjust between the two versions to make further corrections.

What's It All Mean?

Actually I have to admit to a mild case of technology enthusiasm. You probably recognize the symptoms: excitement, feverish thoughts about new products that can be combined to create some new application, unreasonable expectations about pricing and delivery dates, imagined insights into the future delivery of information.

Fortunately, whenever these visions occur—magazines on optical disks, with interactive graphics and intuitive techniques for retrieving information, and so on—reality takes hold. For a mass-market consumer publication, VCRs are as close as we come to having storage devices capable of handling video information. But when the optical drives become as affordable and as easy to hook up as a SCSI drive is today, then we'll all be in the future. And with the write-once, read-many (WORM) drive-mastering system already being sold by ALOT of Santa Cruz, I could be rewriting this editorial by next year. □

Not
everyone
needs
Microsoft
Excel.

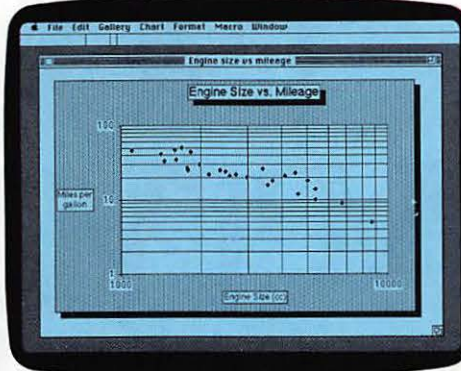
Only people who

1040 Form

Name: **John S. Thomas**
 Address: **123 Main St, Suite 200, Boston, MA 02115**
 Phone: **(617) 555-1234**

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Pay taxes.



Evaluate engine efficiencies.

Travel Expense Weekly

Date	Location	Amount
4/1/88	Seattle	25.00
4/2/88	Portland	5.00
4/3/88	Portland	60.00
4/4/88	Portland	53.00
4/5/88	Portland	71.15
4/6/88	Portland	19.00
4/7/88	Portland	10.00
4/8/88	Portland	20.00
4/9/88	Portland	74.81
4/10/88	Portland	74.81
4/11/88	Portland	88.13
4/12/88	Portland	88.13
4/13/88	Portland	5.00
4/14/88	Portland	1.00
4/15/88	Portland	3.00

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Prepare expense reports.

Accounts Receivable

Invoice No.	Date	Company	Amount
101	12-Jul-87	Wolfgang's Auto Repair	\$1,377.46
102	13-Jul-87	Wolfgang's Auto Repair	\$1,377.46
103	14-Jul-87	Wolfgang's Auto Repair	\$1,377.46
104	15-Jul-87	Wolfgang's Auto Repair	\$1,377.46
105	16-Jul-87	Wolfgang's Auto Repair	\$1,377.46
106	17-Jul-87	Wolfgang's Auto Repair	\$1,377.46
107	18-Jul-87	Wolfgang's Auto Repair	\$1,377.46
108	19-Jul-87	Wolfgang's Auto Repair	\$1,377.46
109	20-Jul-87	Wolfgang's Auto Repair	\$1,377.46
110	21-Jul-87	Wolfgang's Auto Repair	\$1,377.46

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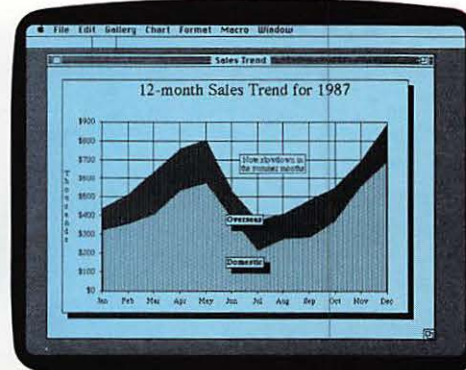
Manage accounts receivable.

Customer & Order

Name	Address	City	State	Zip
P.M. Curtis & Sons	100 Virginia Street, Suite 200	Seattle	WA	98101
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716
Wolfgang's Auto Repair	1015 Western, #2212	Madison	WI	53716

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Manage customer information.



Analyze market trends.



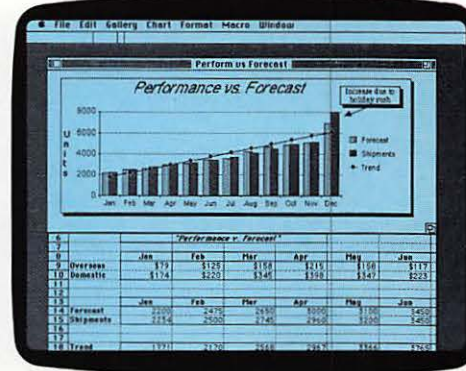
Invest in stocks.

Payroll

Team Member	Base Pay (hourly)	Regular Hours	Total Earnings	FICA	Federal Income Tax	Total Deductions
Anders, Melvin	\$6.50	40	\$260.00	\$12.50	\$52.00	\$70.50
Alvarado, Chet	\$13.00	40	\$520.00	\$41.22	\$114.40	\$155.62
Beach, Cindy	\$14.00	40	\$560.00	\$44.14	\$134.40	\$178.54
Davis, Mrs	\$125.00	20	\$2500.00	\$38.90	\$65.00	\$103.90
Green, Sharon	\$27.75	40	\$1,110.00	\$76.32	\$555.00	\$631.32

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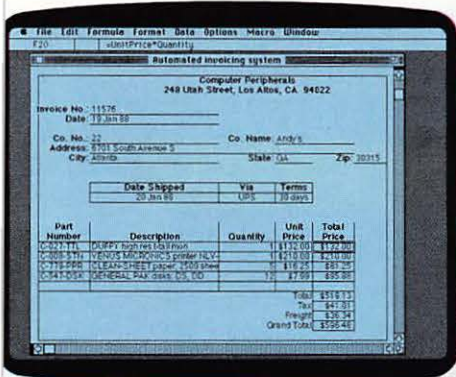
Manage the payroll.



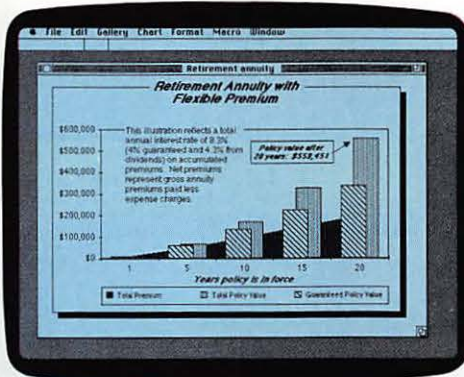
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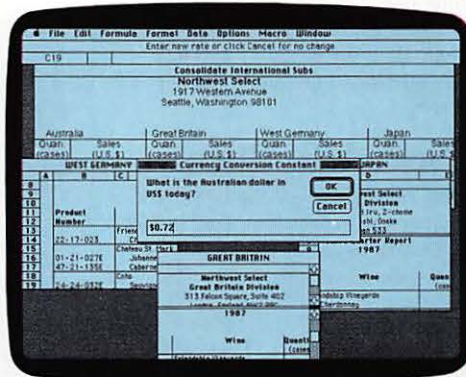
do things like this.



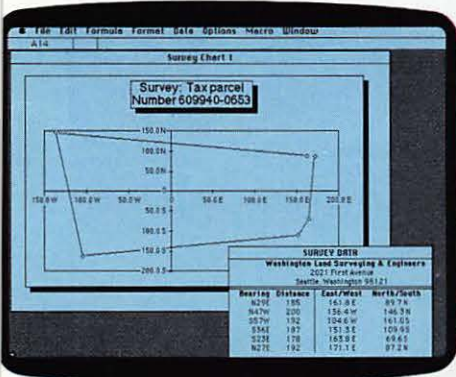
Generate invoices.



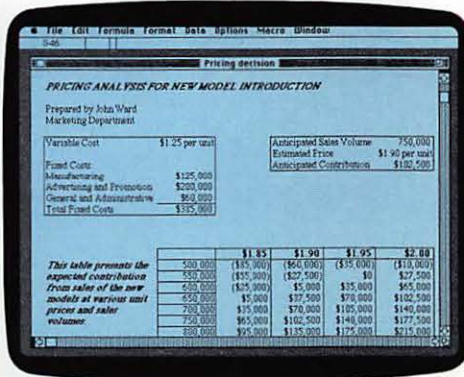
Sell insurance.



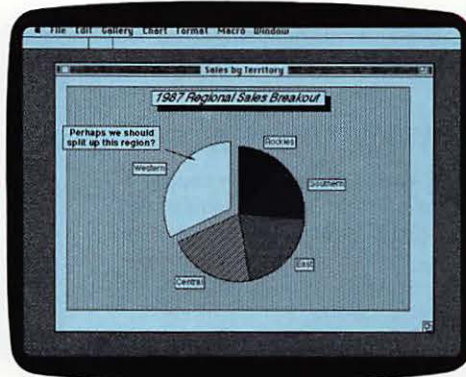
Consolidate international reports.



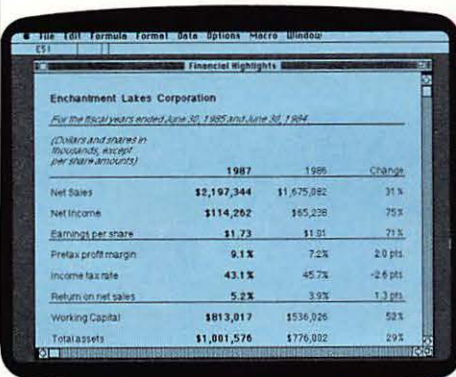
Survey land.



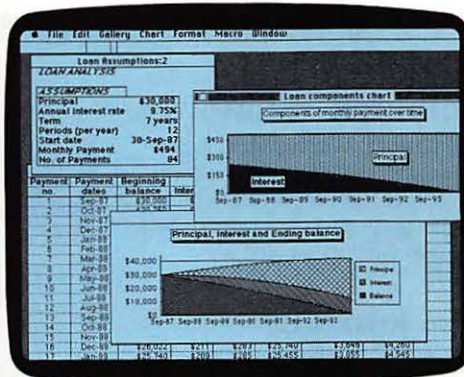
Make pricing decisions.



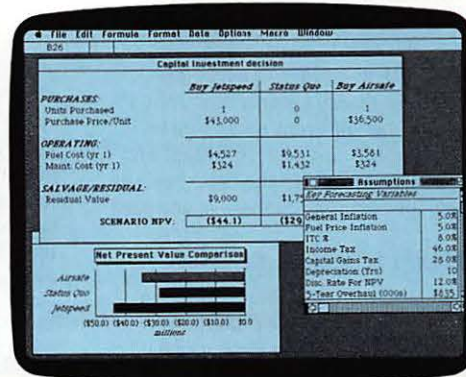
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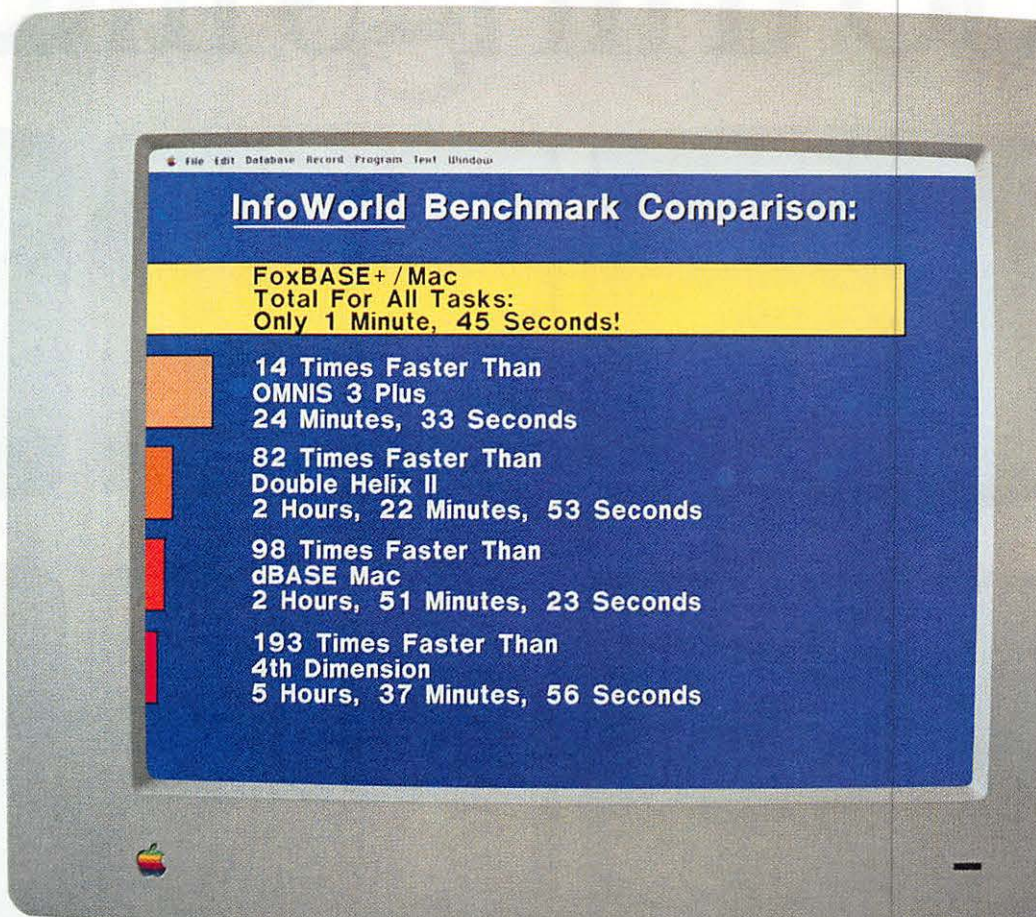
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Circle 152 on reader service card



Is Claris Burning?

A close look at Apple's brash new software subsidiary, and what it means to you

The balloons summed it up. If it hadn't been for the balloons, the Claris party held at last January's Macworld Expo would have been comparable to the party held by its parent company the night before. A splashy location: San Francisco's multi-tiered Design Center. An opulent larder: dozens of buffet tables, some groaning with fresh shrimp, others manned by tuxedoed chefs cooking tortellini. A conspicuously open bar, followed by countless bottles of champagne. Hip music, in the form of The City's hottest white Motown band. Thousands of people mingling cheerily, marveling at the extravagance.

But then, from the ceiling, nets holding thousands of balloons were unloosed. In a scene lifted from a Gatsby-esque party, the yuppies in their finery stopped boogying and raised their arms to grab the colorful balloons. And then—*Pop!*—greedily punctured them—*Pop!*—with fingernails, pen nibs, or the pins on name-tag holders. *Pop! Pop! Pop!*

The party seemed to symbolize something. This was a hypergala thrown by a company that was only starting to sell products *that week*. True, the Macintosh software market is growing, and immediate prospects are good. But the debut struck many as distasteful. Claris entered the marketplace with an advantage that no other software company in the field enjoys—it is owned by the company that manufactures the computer. Claris is funded beyond the wildest dreams of any other start-up, it's already staffed by over 100 employees, and it has inherited a series of products that are already household words in the Mac community because they were previously sold under the Apple label—MacWrite, MacDraw, . . . *MacPaint*, for



heaven's sake. Already, it claimed to be the second biggest Macintosh software firm. Perhaps it would have been prudent for Claris to downplay its riches and advantages and not throw a drop-dead party with shimmering translucent invitations, carloads of shellfish, and those balloons dropping from the rafters.

But low-key is definitely not Claris's style. Heidi Roizen, one of its competitors, puts it nicely: "It's as if Apple decided to have a baby, and instead of starting off the normal way, it chopped off an arm and said,

"We're going through a regeneration process.'" When I visited the Claris offices the week after the Expo, I found that, indeed, Claris was pursuing its goals not with the grungy start-up makeshiftness of Apple's garage days, but with the elegance and confidence that typifies Apple in the eighties. I was impressed with the artfully decorated, spacious digs, and even more impressed with the firm conviction of Claris's officers, notably that of CEO Bill Campbell. They told me, with no apologies, that they were going to make Claris

(continues)

Steven Levy is a Macworld columnist and the author of Hackers: Heroes of the Computer Revolution (Dell, 1985).

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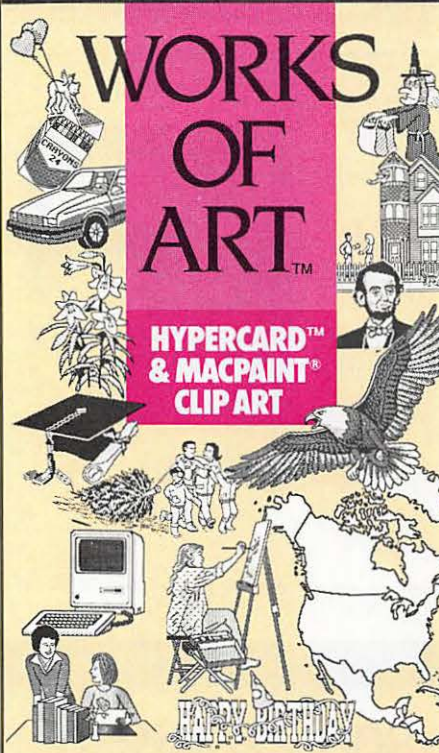
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Steven Levy

the number one software company in the Macintosh marketplace.

They may well do this. But since it's so early in the game, I wonder at how they manage to be so *sure*. Is Claris's success guaranteed? If it does succeed, what impact will it have on its competitors? And most important of all—what does Claris's inception portend for the Mac consumer?

Gorilla Warfare

Claris originated as a result of a flap over a database program now marketed as 4th Dimension. Early in 1987, that program was called Silver Surfer, and it belonged to Apple Computer, which intended to release it as one of its Apple-label products. This prospect outraged Apple's third-party software developers, who finally mau-maued Apple into returning the Surfer to its developer, the independent Acius company. But the problem remained: should Apple confine itself to selling computers, or should it also attempt to generate revenue by selling software for those computers?

If Apple were like IBM, there would be no question about it. Like the proverbial 600-pound gorilla, IBM does whatever it wants to. If IBM releases a word processor and takes advantage of its position by using the company logo on the product, it's tough darts for others who sell word processors. IBM believes developers need it more than it needs them. That's why IBM makes millions selling software, and loses no sleep about alienating competitors.

But Apple, as an underdog, did not have that luxury when the Mac was introduced. Apple honchos realized that the Macintosh would live or die with its selection of third-party software offerings. So great pains were taken to accommodate outside developers—and assure them they would not be competing with Apple.

Recently, though, with the success of the Macintosh, Apple's philosophy has changed. While it still wants to maintain good relations with its developers, Apple thinks it's time to claim gorilla status—it may not yet be a primate of 600 pounds of avoirdupois, but it's still big enough to stifle objections. So in the wake of the Silver Surfer debacle, some Apple executives, peeved that the company had "chickened out" in this case, wrote a position paper stating that Apple should either get out of software entirely or start a company specif-

ically to sell software geared for the Mac. John Sculley chose the latter course and picked one of the guys who wrote that paper—Bill Campbell, then VP of sales and marketing—to head the new venture.

To soothe other software companies, Apple emphasized that the new subsidiary would be independent, and once started would be given no advantage over competitors. It would not sell software under the Apple name and would get no special favors from the parent company. As soon as possible, Apple would spin the company off, and would thereafter hold only a minority of shares.

Function Follows Form

By and large, Mac software developers accepted the idea. The key concession on Apple's part was removing the Apple name from the software. "If they hadn't done that, they would have had problems with developers," says Mike Slade, Microsoft's Macintosh product manager. "Now, they're a very predictable animal. I welcome the competition." He is unperturbed at Bill Campbell's gunslinger challenge that Claris will unseat Microsoft as number one. "I'm glad they want to do well," he says. Darragh Muldoon, president of Cricket Software, agrees: "Competition is good in a marketplace."

Of course, there are some loud naysayers. Prime among these is Sue Morgan, president of SoftView, the company known for its fine MacInTax program. She has a specific gripe: in the weeks before Apple announced Claris to the world, SoftView previewed its FormSystem program to Apple executives, who requested more information on it. Morgan provided her marketing ideas about the program and about forms-generating in general. Imagine her surprise when one of those Apple executives signed on to be a high official in Claris—and he told Morgan that one of Claris's top priorities would be to release a forms program.

As they did with several other products (reportedly these included Ann Arbor's FullWrite and Quark's XPress), Claris officials tried to purchase the rights to Morgan's FormSystem. But in a move that she considered typical of Claris's arrogance, they refused to come up with cash to buy her company or its product, but offered only a licensing agreement. Morgan turned them down, and Claris subsequently arranged a licensing agreement with the de-

(continues)

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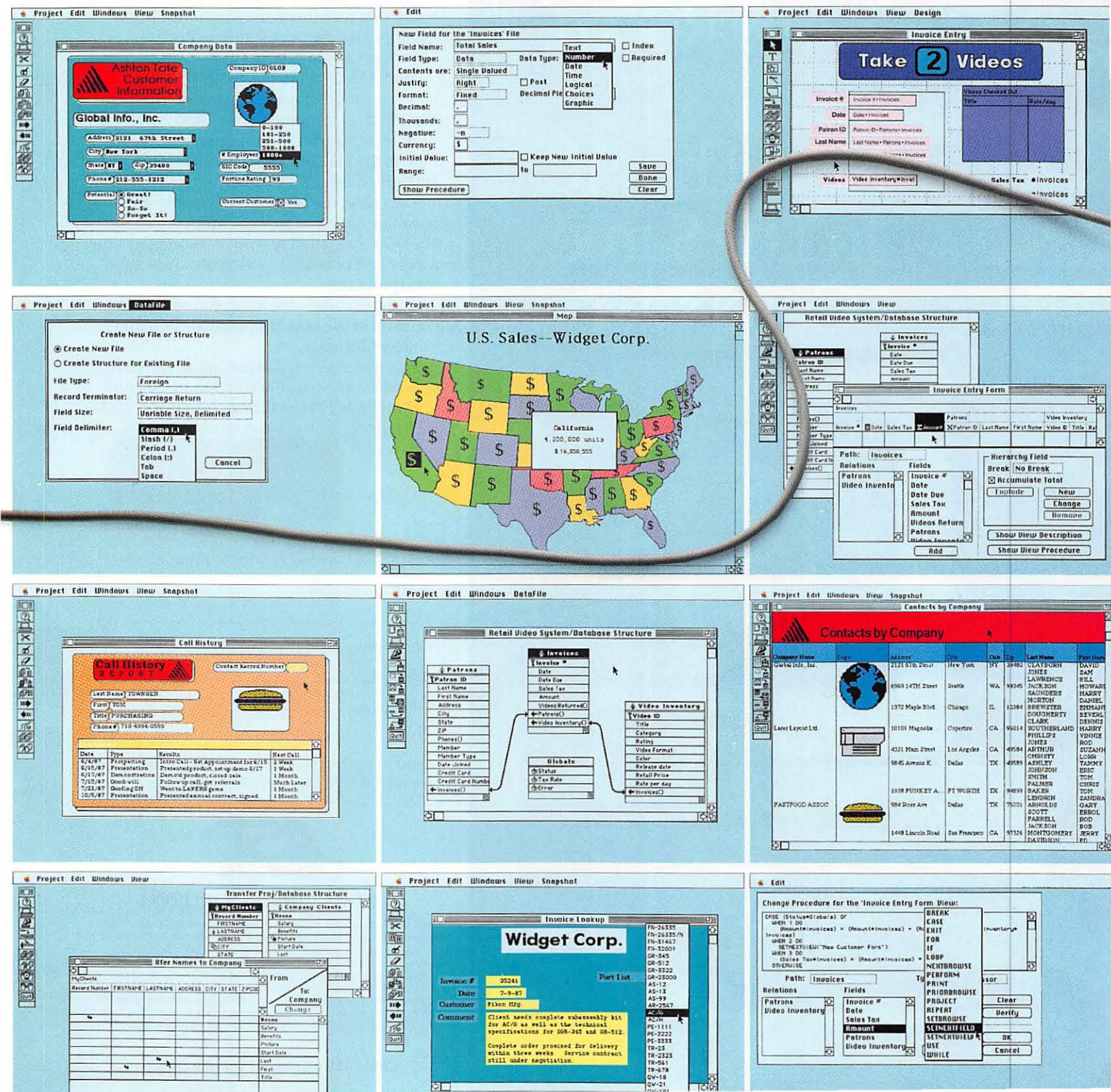
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Steven Levy

veloper of another product, which will be released as SmartForms Manager and Designer.

Sue Morgan thinks she was mistreated, and wrote Apple to that effect. "They ignored it," she says. This is in keeping with Morgan's theory that Claris's formation—and the imperial attitude it embodies—will usher in a dark age of relations between Apple and its developers, and that the consumer will eventually suffer. "Before, Apple was bending over backwards to reach developers," she says. "That's not so anymore. But there's another place that the smaller developers can go. Right now there's a Macintosh, but soon the IBM Presentation Manager [which works like Macintosh but promises a larger installed base] will come. I think Apple is being very short-sighted. They don't see the danger [that developers might abandon the Macintosh rather than compete with Claris's money]." In fact, SoftView, formerly a Macintosh-only company, is now working on a version of its form program for the IBM PS/2 machines. "We made that decision after the Claris problem," Morgan says.

If Sue Morgan's opinion is shared, few companies are voicing it. It may well be that they don't want to offend the gorilla. (Even before Claris, smaller companies were finding it tough to compete in the growing Mac market; ergo all those mergers.) In any case, I don't perceive competitors spurning the Mac because of a Claris threat. To the contrary, the same week that Morgan was preaching doom and gloom to me over the Claris issue, Ashton-Tate, a fairly savvy software firm, was making a megamillion-dollar investment in Macintosh by purchasing Ann Arbor Softworks and its products, making its own bid to be champion of the realm. As far as the Mac is concerned, "We're going to go full-steam," says Ashton-Tate spokesperson Brad Stevens, obviously unconcerned about the threat of Claris.

The Ghoul Pool

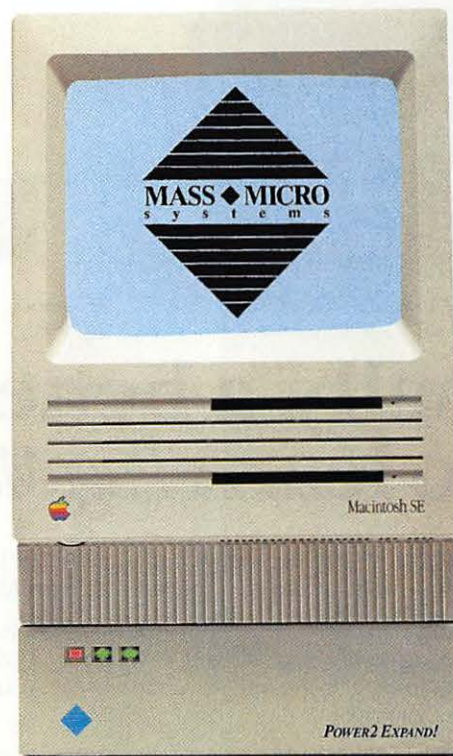
One reason that Ashton-Tate, Microsoft, Cricket, and other developers are so sanguine is that Claris is not exactly a shoo-in for success. While Bill Campbell flatly proclaims that every Claris product is destined to be either number one or number two in its category, the actual products do not yet bear this out. While the new ver-

(continues)

Circle 155 on reader service card

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The Competition

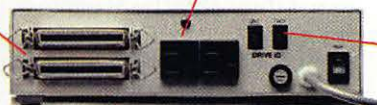


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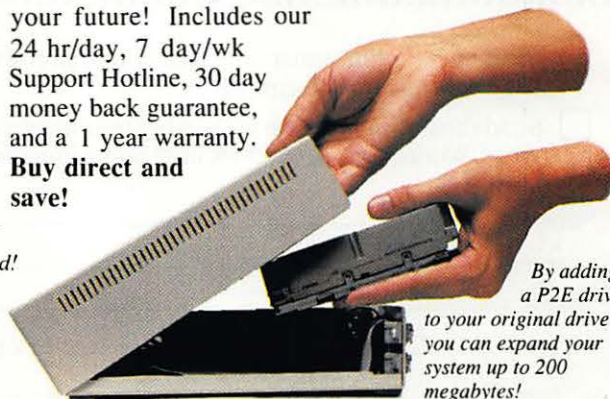
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Circle 42 on reader service card

Steven Levy

sions of MacDraw and MacProject look good in prerelease form, and the SmartForms program opens up a new market, the new MacPaint and especially MacWrite do not have competitors begging for mercy.

I take particular exception to MacWrite 5.0, a pitiful response to superior products like WriteNow and Microsoft Write, or even to the word processor in Microsoft Works. There may be 600,000 copies of MacWrite in circulation, but most were given away free. This upgrade was a chance to provide a top-quality improvement to a lot of people who had been stumbling along with an antiquated product. What could Claris have been thinking, to release a word processor in 1988 that does not support multiple documents on screen?

There are other strikes against Claris, too. Developers like to point out that while Campbell and crew are Mac knowledgeable, bright, and energetic, none of them have experience in doing exactly what Microsoft, Cricket, T/Maker, and other firms have done—building a software company from scratch and managing its growth through dizzying expansion. "They're not hungry," one entrepreneur notes. Another problem for Claris is the shaky stock market situation, which already has postponed the projected spin-off date from "as soon as possible" to a date well into 1989. Some cynics think that Claris will never reach the level of production necessary to justify a public offering; a persistent rumor has it that Apple employees have established a pool to guess when Apple will announce that the Claris experiment has failed.

Title Search

Actually, I would hate to see that happen. I think that the Macintosh consumer has much to gain from a successful, independent Claris. If nothing else, Claris is now providing a valuable service never before available to owners of Apple-label software: free phone support. (Even if you own an old copy of MacPaint, Draw, Project, or Write, Claris will answer your questions and attempt to solve your problems; call 415/962-0371.) Also, Claris's upgrade policy is quite a bargain. Those who have been scraping by with an early version of MacPaint can substantially improve their lot by getting version 2.0 for only \$25. The Draw

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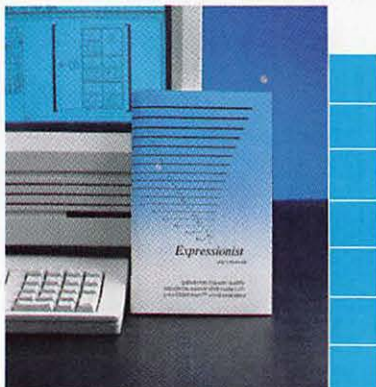
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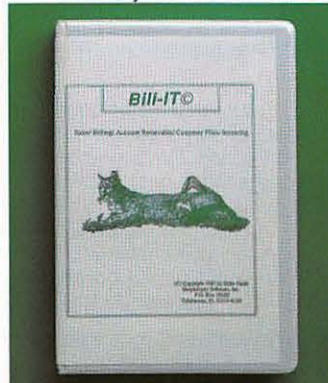
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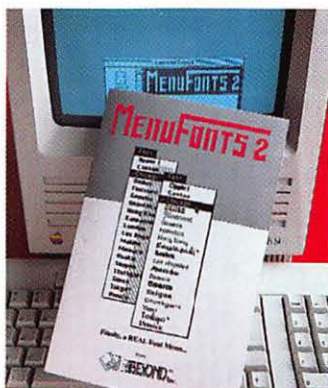
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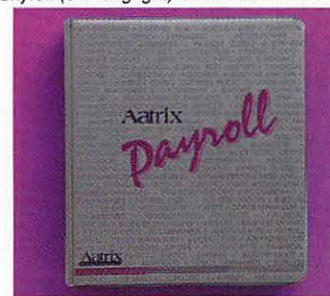
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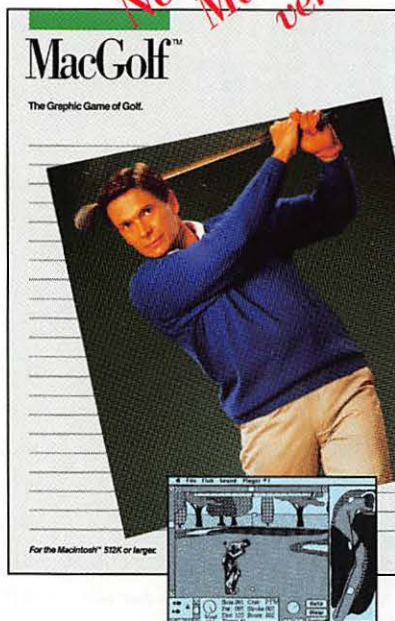
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Steven Levy

and Project upgrades, at \$100, are also good deals, and even MacWrite owners will find the spell-checking and other improvements worth \$25.

In the long run, Claris should bring more substantial benefits. As explained to me by Yogen Dalal, Claris's highly regarded VP of product development, the company's immediate plan is to buy the best already-developed products from software authors. But Claris is building a team of its own engineers, charging them with the mission of creating breakthrough Macintosh software. (Since Claris's new software runs only on the Mac, presumably it uses the computer more fully.) The breakthroughs would come in the form of pioneering "platform technologies"—new categories of use, comparable to the creation of desktop publishing several years ago. If Dalal and Claris pull this off, it promises increased productivity for all of us, and keeps the Mac viable as a leading computer.

So we all have a reason to root for Claris. Yet if Claris accomplishes its quest for superiority, it wouldn't exactly be a triumphant replay of *Rocky*. After all, its leaders, and the Apple executives who set them on their way, could say they knew it all along. On the other hand, sometimes overweening confidence can lead to a fall. So while I eagerly anticipate Claris's new generations of Macintosh software, I remain wary of the company's brashness, its chest-beating, its claim to rightful ownership of the prime spot in the Mac software world ... in short, everything exemplified by the balloons that floated from the ceiling in the controversial party last January.

With those thoughts in mind, I propose a reconsideration of the firm's name. Last summer, after a spirited chorus of suggestions (many good names already taken), Apple chose Claris, according to Bill Campbell, because of "its inherent marketing appeal, reflecting clarity and distinctiveness, and to remind us that shaping the future requires a clear vision." That's fine as far as it goes, and I know it's a bit late—but I do have a humble suggestion for a different moniker. This one has an equally Hellenic flair, and the added advantage of capturing the company spirit: Hubris.

Good luck, guys. □



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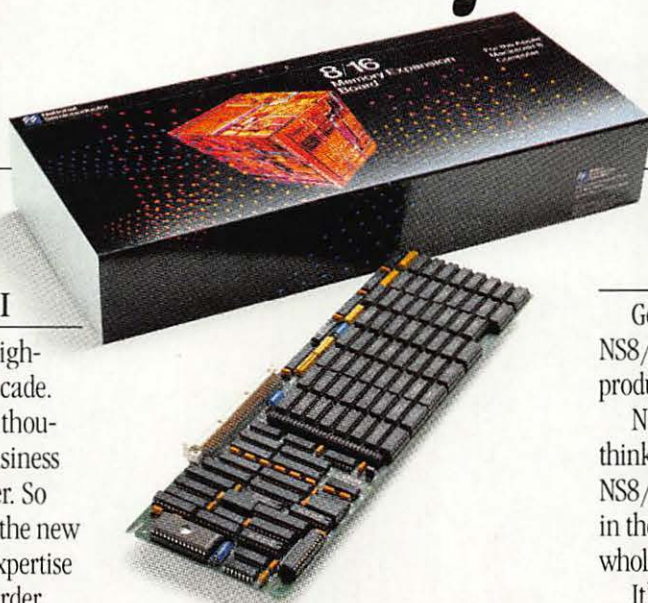
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Circle 161 on reader service card

Verbatim

An interview with Reese Jones, president of Farallon Computing and president of BMUG



Reese Jones bought a Mac on the first day they were available in January 1984. This is a familiar story among Mac product developers, but this version has a twist. Rather than deciding right away to drop his biophysics research and start programming, he established a user group, the Berkeley Macintosh User Group, now known as BMUG. The group made his house its headquarters. Later, on the way to figuring out how to share his LaserWriter with the BMUG folks down the hall, the notion of using phone wires for networking emerged. For a while Jones distributed network kits through BMUG, letting others link up Macs and printers with the technology he'd developed, but he and his cohorts quickly discovered that many individuals and businesses preferred purchasing finished goods to soldering the kits. Thus Farallon Computing was born. Both BMUG and the company moved out of Jones's home, but Jones remains active in the group as president.

Are you conscious of changing hats when you go from leading a consumer group to leading a company?

We're trying to be a company that user groups won't criticize. I think some companies, big companies, tend to become arrogant and forget that they started out to provide a product that's of value to the customer.

We spend a lot of our resources helping people, even people who are not necessarily our customers. By contrast, Apple had no direct tech support for its customers at all.

What are some examples of things companies do that offend the consumer?

Well, too often the company blames consumers themselves for having problems with products that are difficult to use or don't work. If a product breaks two days after the 90-day warranty is up, the company should back it up anyway.

What's a reasonable warranty policy for hardware?

At least a year.

What Mac products would you advise someone to buy to computerize a small business?

First, a hard disk—40 megabytes or more if you're doing much work with pictures, HyperCard, or sound. So somewhere between 20 megabytes and 80 megabytes—anything more than that and you're paying a little bit extra because it's state of the art.

The next thing to get is probably a big screen. That makes more of a difference in many people's lives than additional RAM. Third, more RAM. Fourth, an accelerator card. That's for the general-purpose user,

someone who uses word processing, drawing programs, spreadsheets, desktop publishing.

Would you recommend that people start with a Mac Plus or an SE?

The Plus will soon be a dead machine. It costs more to make a Plus than to make an SE; it uses a different mouse and keyboard scheme; it's effectively been discontinued. There is one reason to choose a Plus over an SE though: Pluses are quiet.

What about software?

A word processor. Most people would be happy with MacWrite, WriteNow, or Microsoft Works.

As for spreadsheets—in effect, there is no spreadsheet other than Microsoft Excel. For most people, the spreadsheet in Microsoft Works is more than adequate, though, unless they're actually doing intensive spreadsheet work. It's fine for mailing lists, lists of addresses, graphs, or a checking account.

Any other programs?

Now that HyperCard is shipping with the Macintosh, it can do almost anything you might want to do with a database. And if you have HyperCard you really have no reason to buy MacPaint, unless you need to do full-page images. I would advise getting MacDraw.

For communications, I recommend starting out with FreeTerm. It's free, and it does most things. You can decide from there whether you need to get further involved with communications.

(continues)

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Guy Kawasaki
Ex-Macintosh software evangelist
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"I have absolutely no training in databases, but I'm now using 4th Dimension day in and day out."

"Anything I want, I can build by myself.

The graphics are super. 4th Dimension is so easy to set up, easy to modify, flexible

and powerful. And I'm getting technical support from ACIUS anytime I need it.

4th Dimension doesn't eat data. If I make a mistake, data is preserved. I've never needed a backup copy of anything, and I've put it through some pretty severe torturing."

Walter W. Stewart
4th Dimension end user
Research Physicist, National Institutes of Health* ■

"4th Dimension is the most powerful database I've ever recommended for a micro."



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It simply gives you all the tools you need to fully exploit the Mac and bring new power to your specific applications.

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In fact, I've become a developer myself. I wanted a point of sale application to run my business. I developed the system originally on a competitive product, but it didn't have the horsepower to solve the problems. 4th Dimension has the power to do anything I want to do.

I can offer no more sincere testimonial for the products I sell than to use them to manage my own business."

Dick Applebaum
Apple dealer and business co-owner
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user friendly."**



"In other words, what you see is what you're used to working with.

These are the reasons I like 4th Dimension: It's got the power to do everything I need in a complex vertical

market. It's got the interface to make that possible without taking on a second career. It's got layout graphics that can make your product look as good as it works.

You can sit down and use 4th Dimension without doing much to it, and you still have complete power. It has some dynamic, *dynamic* graphics. All this without programming. The others bog you down in housekeeping chores.

The custom mode enables me to use words, sentences, phrases, and icons that are familiar to my people in the real estate business. I have the ability to customize menus and menu items.

I enjoy working with 4th Dimension because of its power, interface, and the ability to create

custom programs for my clients. I can't think of anything better than 4th Dimension as a development tool, and I've looked at them all."

Ted Bohrer
Developer
Concept 2001 ■

**"The thing I like best about 4th
Dimension is that it works the way I
expect it to work."**

"The whole screen interface is so much nicer than the others.

With dBASE™ I spend a lot of time looking at the books and then creating screens. I never get it near right the first ten times.

I really like the way the subfiles work. I use that a lot because I maintain inventory sheets and I need to pull information from other places.

I like how it does everything automatically, like buttons, radio buttons, check boxes, and scrollable windows. You really don't need training to use these features."

Diana Foster
4th Dimension user
PC Coordinator ■



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The Plus will soon be a dead machine. It costs more to make a Plus than to make an SE.

What about desktop publishing?

PageMaker is an excellent program; we use it at Farallon. And ReadySetGo is another good one. But mostly they make it a little easier to do what you can already do with MacDraw, MacPaint, and MacWrite. And \$700 is a lot of money to spend for a program.

What about your company's products, the network products?

Our PhoneNet system allows you to construct—in a modular way—networks of arbitrarily large size using ordinary telephone wire that's already there. It also enables you to create a very reliable network—the real cost of a network is what it costs if it goes down. If a problem occurs the

software automatically isolates it, notifies you of the problem, and so on.

How can using the phone lines influence the reliability of a network?

AT&T spent hundreds of millions of dollars designing modular plugs and wiring that could be easily installed and easily fixed—plugs and fixtures that are very reliable, simple, and inexpensive. People aren't tripping over wires, things aren't coming unplugged.

Every building has a conduit already installed for phone wires going out to every desk. From the phone wiring closet someone can work on the whole system very easily.

How does PhoneNet differ from, say, AppleTalk or Ethernet?

PhoneNet runs at the same speed as AppleTalk cabling—or as they call it now, LocalTalk cabling: ¼-megabit per second. It also supports TOPS's FlashTalk standard that's now evolving, which is about three times faster than AppleTalk.

Ethernet is about 50 times faster than AppleTalk in sending signals down the line. But Ethernet is only about 5 times faster than AppleTalk in transferring a file from a central server to a particular computer; the limiting factor is the rate at which the data can be read off the server's hard disk and deposited on the local disk.

Actually, most of our customers mix and match PhoneNet/AppleTalk, Ethernet, and other higher-speed protocols. We often describe PhoneNet as the city and neighborhood streets, and Ethernet as the freeway. Not every person needs a freeway ramp right at the front door, but every person on the system should be connected to everybody else.

AppleTalk runs 50 to 100 times faster than modems, the country-road link;

(continues)

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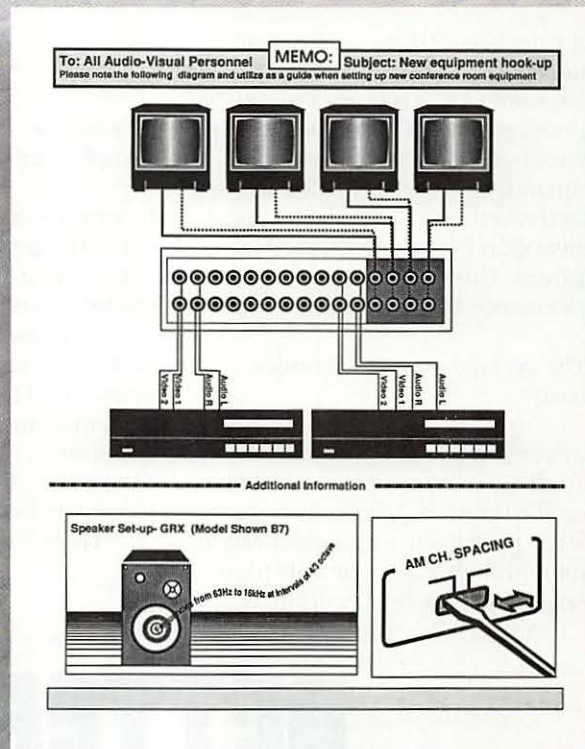
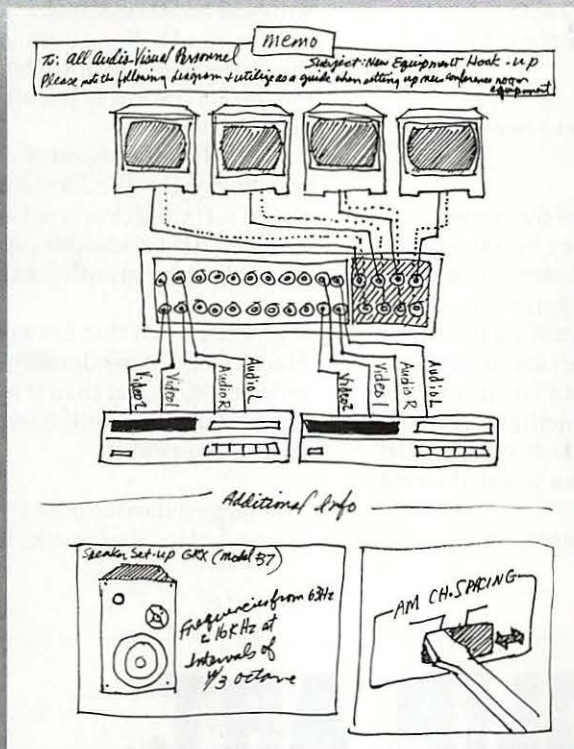
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There's a notion of a 32-node AppleTalk limit, but that's mostly a function of Apple's connectors.

Ethernet runs 10 to 50 times faster than AppleTalk. Speed costs money. Not only that, if you want to go faster it's less reliable and you can't go as far. Our network management tools, such as TrafficWatch and StarCommand, monitor network traffic so you can tell whether a particular segment of the network is being overutilized or underutilized. This lets you optimize the cost/performance of the whole system.

What's the average number of nodes per system?

We have over 250,000 nodes installed. Some installations have 3000 or 4000 machines on the network, but the average network has perhaps five to ten machines. PhoneNet is probably more heavily used in large networks; Apple's LocalTalk is

used more in small, printer-connection networks.

At what size do networks become complicated?

It depends on the use of the network. As networks get bigger they become more complicated to plan, maintain, manage, and operate—and that's largely what our network software does. Knowing the traffic flow between one computer and one printer is of no value, but when you have 2000 machines and something seems to be going awry, it's enormously complicated for a person to figure out where the problem might be.

There's no particular limit to network

size on AppleTalk. There's this notion in the marketplace of a 32-node limit, which is what Apple says the limit is, but that's mostly a function of the hardware of Apple's connectors. Once the signal passes by that many connectors, it's completely absorbed. With PhoneNet connectors the electrical limit is no longer a factor. It's quite reasonable to have a single network with 450 or 500 machines. Take the case of a networked college dormitory: even if all the students in the dorm have a computer, they would probably not all be using the network at once.

On the other hand, if you are doing very heavy graphics/desktop publishing/image scanning over a network, you might overload the bandwidth capacity of the network with only three to five machines.

It's well known that networking on the Macintosh is considerably easier and more economical than it is on IBM machines. Are there still barriers to Macintosh networking?

The biggest barrier now is perceptual. The concept of local networks is very new for

(continues)

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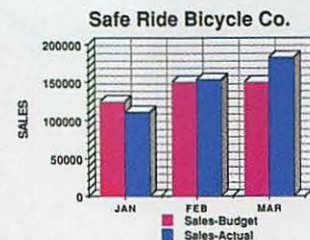
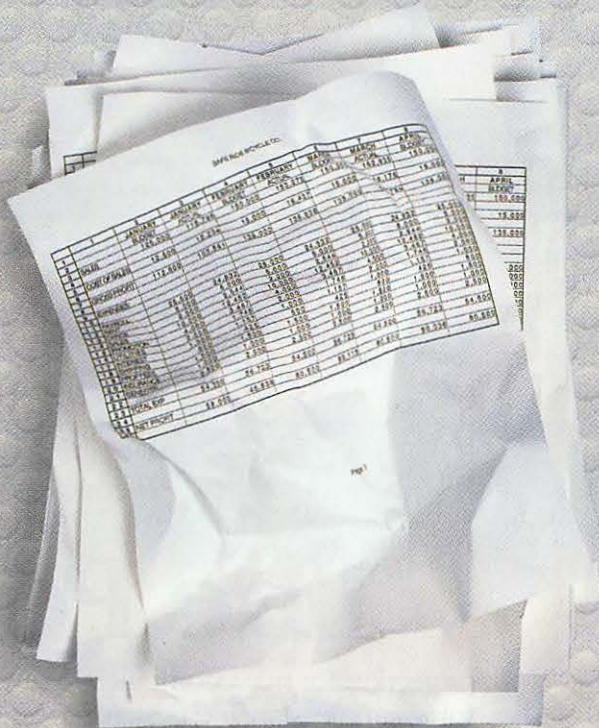


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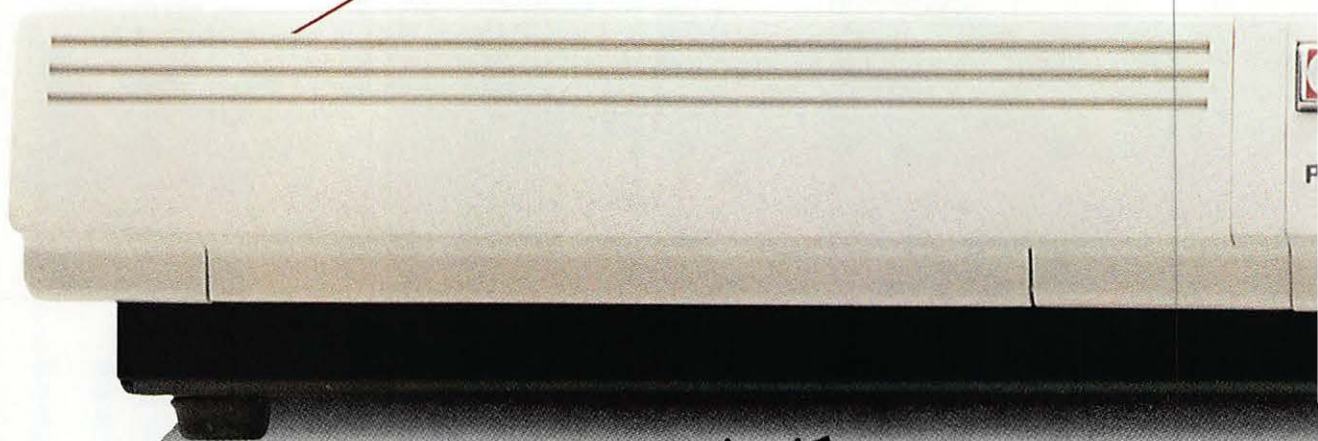
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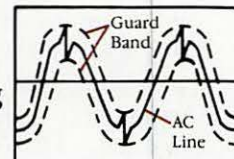
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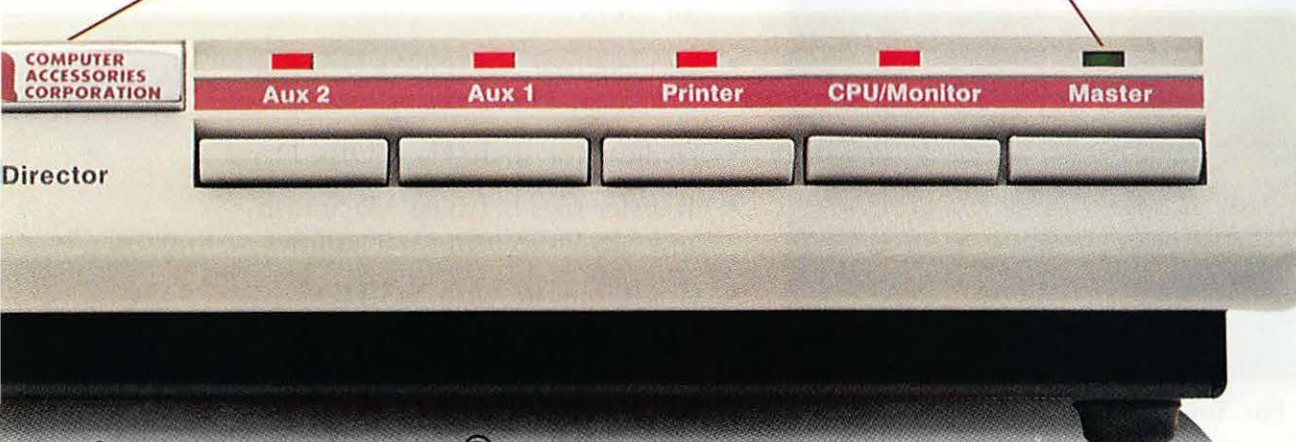
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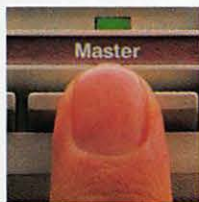


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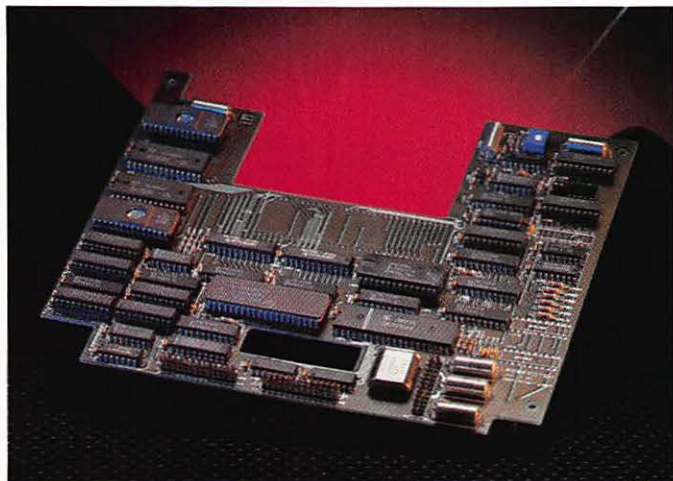
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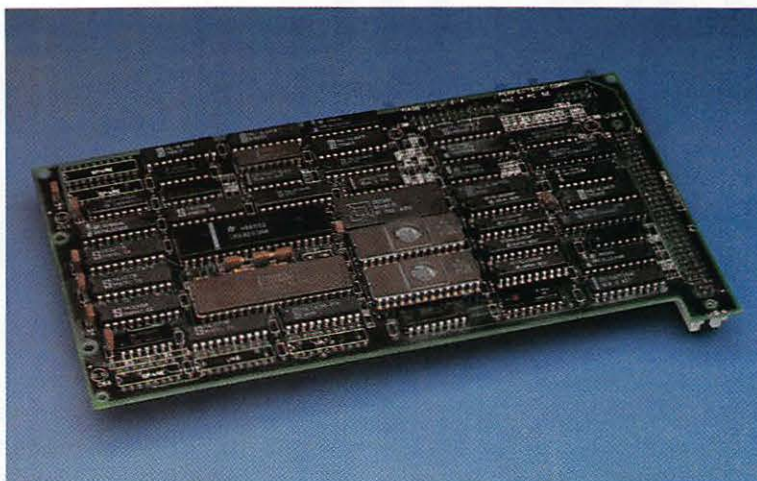
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Another direction for the future is a much closer integration of computers and telephones.

most people and somewhat difficult to understand at first. There's an enormous amount you can do with networks now, but it's difficult to find simple, clear sources of information on the subject. Our tech support people spend a lot of time on the phone explaining what a network is, what a zone is, and how to network two buildings or two cities.

What are people using networks for?

Most people use a network to share an expensive printer. A network also brings electronic mail. The third most important use of a network is sharing files; that's where you get into the file servers, like AppleShare and TOPS, that allow all the computers on a network to exchange document files very easily. And now

people are beginning to use the network as a gateway to other devices, such as mainframes or shared modems, that everyone would like to be able to access from their desks.

What about competing network standards?

There are a lot of companies working on connecting all these things to one another. From the consumer's point of view it really doesn't matter much what comes along in the future, so long as what you put in now can be connected—or "gatewayed"—into those future things.

What do you expect in the future?

Everything will be connected to everything. When telephones first came out, nobody wanted one because they thought, *Well, who am I going to talk to—none of my friends have telephones.* It took 50 years before a phone became a necessity.

Now networks mainly improve efficiency within a single business. In the future, businesses will be connected and information will flow from one to another through networks, through electronic mail and fax machines. So that when a retail company orders a product, that order is transmitted to the manufacturer over a network, and at the same time the money is transferred from the retailer's bank to the manufacturer's bank; the money is then taken from the manufacturer's bank to pay the supplier for parts, and finally the product is shipped to the retailer.

The other long-range direction for the future is a much closer integration of computers and telephones. This is the area we're working in now. Computers are becoming powerful enough that they can deal with voice input as a type of data. If you're sending a memo to someone,

(continues)

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What's best for Apple might not be best for third parties, but it's probably best for consumers.

there's no particular reason you have to type it out. You could just talk to your computer.

And if you could send your voice over the network, that memo could then be distributed to 7000 people. No secretary to type it up, go to the copy room to copy it, or stamp and mail it. The memo would be delivered instantaneously throughout the network without your touching the keyboard at all.

With answering machines people are getting used to the idea of talking to a machine. Ten years ago these sorts of telecom/voice integration things were technologically possible, but people didn't want to do it; it was just too weird.

MacRecorder is the first step toward that?

As it stands today, MacRecorder is intended to be a general-purpose sound-input device for the Macintosh that allows you to get real sound or voice into the computer, manipulate it, and edit it. It's designed to make adding sounds to HyperCard extremely easy. We have licensed the MacRecorder technology to other developers who will integrate voice and sound into their business products.

For the future we're working on integrating computer communication and speech. Since PhoneNet and the telephone run over the same lines, it makes sense to try to integrate them.

For example?

A voice-messaging center. People would call in, and their messages would be displayed on your computer. You could search for a particular message automatically.

The technological difficulty is that there's a lot of information in a sound—more than in a picture—and it takes up a great deal of space. We've devoted a lot of attention to compression algorithms that take a large amount of information and store it in as small a space as possible.

How much compression?

Without any compression each second of sound of reasonable quality, like FM radio quality, takes up to 44K or more. So in a 1-megabyte Mac Plus you get 10, maybe 15 seconds of sound before all the memory is used up. Our compression algorithms rely very heavily on the CPU to compress the sound by a factor of eight as it's coming in. So in 1 megabyte you could record 7 or 8 minutes of sound.

One of the goals of this compression is that it be able to happen in real time on an ordinary Macintosh without any special hardware—that is, compressing at least as fast as you record. That's so that it can be sent out over the AppleTalk network to other computers while you're still talking. If you didn't compress at all, you'd use more than 100 percent of the capacity of the network.

Are there any other challenges that you face as a developer, particularly as an AppleTalk developer?

Apple in general does a very good job of promoting a collaborative relationship with its developers. But the AppleTalk or network management area is a rather risky-spot to be working in since your product may instantly become obsolete because of something new that Apple does. And Apple would release its product in the form of System software; that is, Apple would essentially give it away. No matter how low you price a product, you can't compete with that.

We'd like a bit more warning from Apple to third parties about its plans to introduce a product. What's best for Apple might not be best for third parties, but it's probably best for the consumer. □

Interviewed by Nancy E. Dunn



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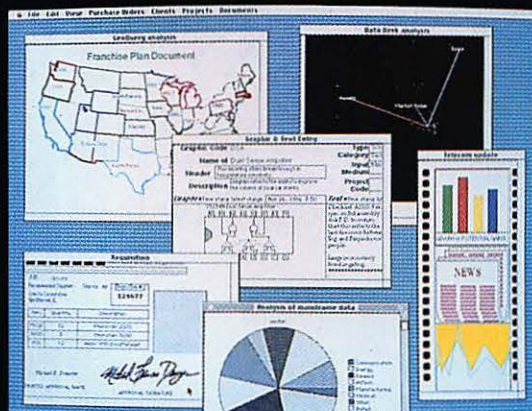
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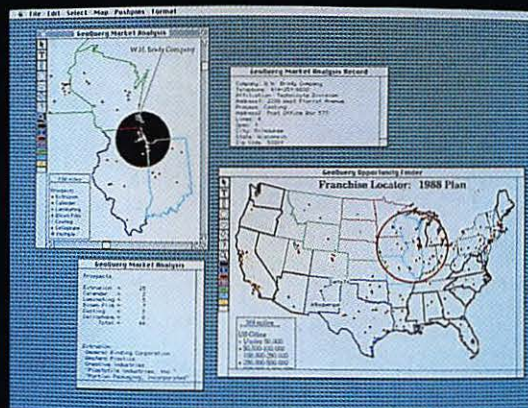
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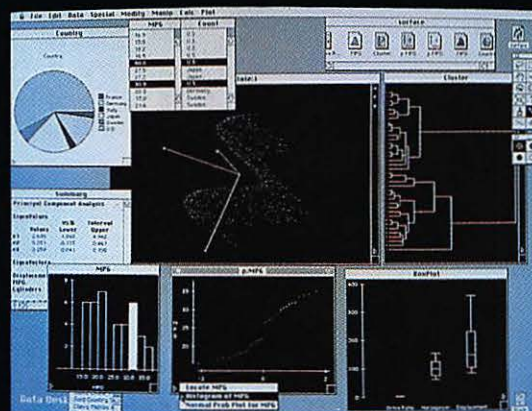
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Macworld News

by Gil Davis

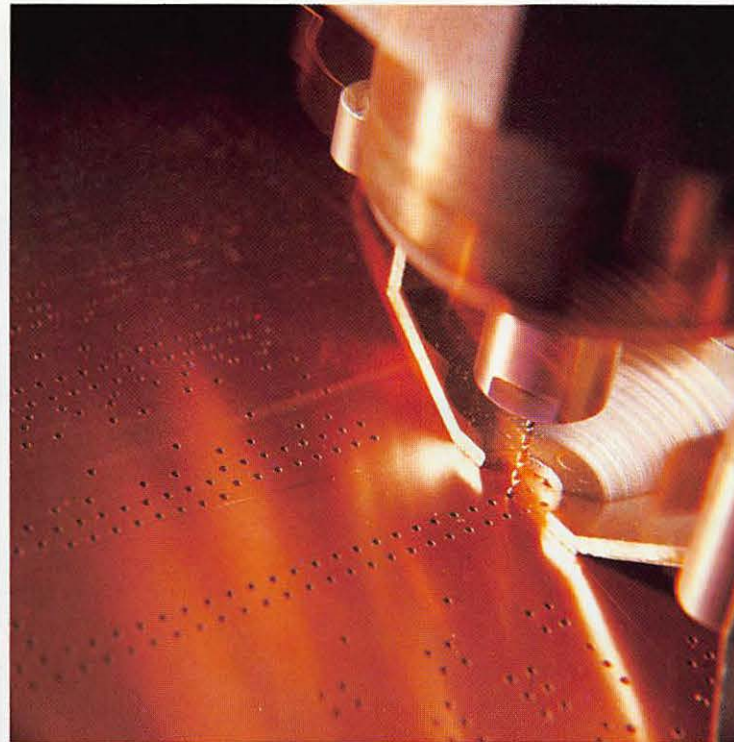
Mac Grows Mac

 How do you use a Macintosh to design its own plug-in printed circuit boards? With Douglas Electronics' Douglas Professional CAD/CAM System software, which takes you from printed circuit board (PCB) to the automatic drilling of holes for components.

In 1984, the MegaMac, which was among the first boards designed with this system, expanded a 128K Mac to a full megabyte of RAM. Since then, Apple Computer and numerous other vendors have used Douglas software and manufacturing facilities to produce more than 80,000 Mac and non-Mac boards.

Douglas offers four levels of its software, ranging in price from \$95 to \$2900. The \$95 version, called Douglas CAD/CAM Basic, provides only PCB layout—resulting files must be sent to Douglas for printing.

At the high end, the \$2900 Douglas CAD/CAM Professional System is a fully integrated



Following instructions from a nearby Macintosh, this machine drills holes in a printed circuit board also designed on a Mac.

design/analysis system. To use it, you first draw the circuit's schematic diagram on the Mac screen using an extensive logic-parts library and a host of

drawing features supplied by Douglas. You also draw the PCB outline and indicate where the parts will be placed. After performing an optional logic analysis, the software takes the circuit description and automatically connects all the parts using your design specifications. The result is a PCB design that took far less time than a hand-drawn layout and is far more accurate.

Today's Douglas Professional CAD/CAM System software is faster than the earlier versions, uses the Mac II's color screen, handles larger and more complex designs (up to 32 by 32

inches), and even lays out multilayer boards. For further information, call Douglas Electronics in San Leandro, California, at 415/483-8770.
—David L. Peltz

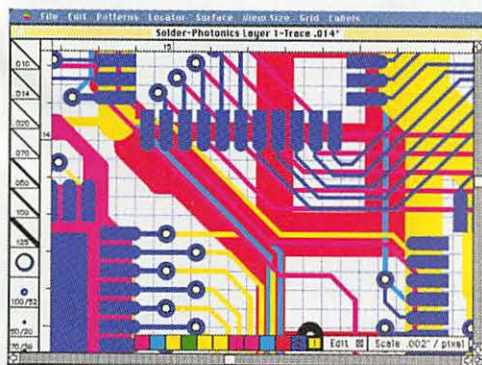
Model Trains Get Digital

 If you worry that the Macintosh has become too much of a businessperson's machine, Marklin's Digital Starter Set might just change your mind. Germany-based Marklin, which boasts a long-standing reputation for producing exquisitely designed model trains, has made a unique model train set—one you can control with your Mac.

The HO-scale set includes two digital locomotives with an assortment of rolling stock, two electric switches (and a decoder to operate them), a central control unit, a transformer, and two ovals of track. Other digitally controlled devices are also available.

The Digital Starter Set works without the Mac, but the real fun and challenge comes when you connect a Macintosh to the train set's central control unit via the Macintosh's serial port. Then you can write programs to control as many as 80 locomotives and 270 other digital devices.

(continues)



Multilayer circuit boards are no problem for Douglas Electronics' manufacturing-oriented CAD/CAM program for the Mac. Each layer appears in a different color on the Mac II monitor.

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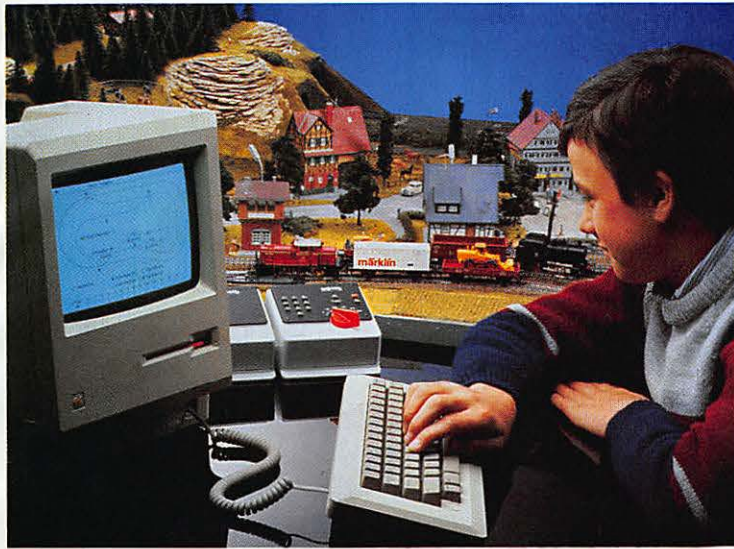
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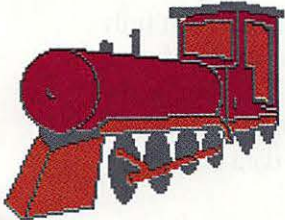
Circle 117 on reader service card

S I G M A D E S I G N S



There's nothing like a model train or a Mac. Put them together and you have a nearly irresistible combination.

Dr. Tom Catherall, director of the Office of Youth Research and Development at Brigham Young University, has an elaborate layout that he controls with HyperCard. He has drawn a scale map of his layout in HyperCard. Then, by embedding buttons throughout this map, he points and clicks his mouse to change switches, activate signals, create smoke, turn on lights, and couple rolling stock. Other buttons enable him to control the speed and direction of several locomotives simultaneously. And, on a more sophisticated level, he can control certain functions with IF statements. For example, he can re-



route a train if there is another train ahead on the same track.

For Catherall, the digital train layout is far more than just fun. Working with Marklin, he has been using the train set as a tool for teaching. Regulating the train layout via computer brings an otherwise abstract concept to life. It also teaches

basic electricity and mechanical control.

Digital Starter Set is list priced at \$965. For further information, contact Marklin in New Berlin, Wisconsin, at 510/101-0029.—Keith Thompson

Apple Is for "A"



The Gorilla Foundation in Woodside, California, is using American Sign Language (ASL) and a Macintosh to communicate with gorillas. You may recall the foundation's work with Koko the gorilla (see *National Geographic*, January 1985 and October 1978, and *The Education of Koko* from Holt, Rinehart & Winston, 1981). Since receiving an equipment grant from Apple and subsequently becoming part of Apple's Vivarium project (see "Waiting for Alan," *Macworld*, August 1986), the foundation has started using Macintosh-generated graphic teaching aids.

Koko, a lowland gorilla, was born at the San Francisco Zoo in July of 1971, and began her instruction in ASL one year later. Because a gorilla's hands are somewhat shorter and the

thumb is farther back than a human's, Koko has some difficulty shaping certain ASL signs and has created her own versions, appropriately referred to as Gorilla Sign Language (GSL). In Koko's alphabet, the initial letter of a series of letters that represents entire words can become the shorthand sign for that word. Thus, in GSL, the word-sign for Apple is the letter A. To teach Koko to read English, pictorial representations of Koko's signs coupled with their intended letters are produced with the Macintosh. These custom reading tools are printed on manilla folders—Koko eats them if they are printed on paper.

Koko uses sign language to communicate with Michael, a



RONALD H. COHN

Koko, a lowland gorilla, is the subject of a communication experiment that includes the Mac.

male gorilla, and even forms the hands of her dolls into signs. The foundation hopes Koko and Michael will mate and pass on GSL to their offspring as some chimpanzees have done in a similar study conducted at Central Washington State University.

Before moving to Woodside, Koko lived on the Stanford University campus, where she had access to the voice synthesis capabilities of Stanford's mainframe. At that time, she could

sign a word while simultaneously activating voice synthesis of the same word. The Gorilla Foundation plans to provide some way in which Koko can interact similarly with the Macintosh. One of the problems is



Koko uses cue cards designed and printed on a Macintosh.

that Koko is so much bigger now that gorilla-proof equipment will need to be designed.

The Gorilla Foundation is a member-supported nonprofit organization. Members receive a semiannual journal called *The Gorilla*. The foundation puts together this publication—which includes photos, articles, and transcripts of verbatim conversations—on its Macintosh. If you'd like to join, send a tax-deductible contribution of \$25 or more to The Gorilla Foundation, Box 620-530, Woodside, CA 94062.—Christopher Yavelow

As Big as All Outdoors

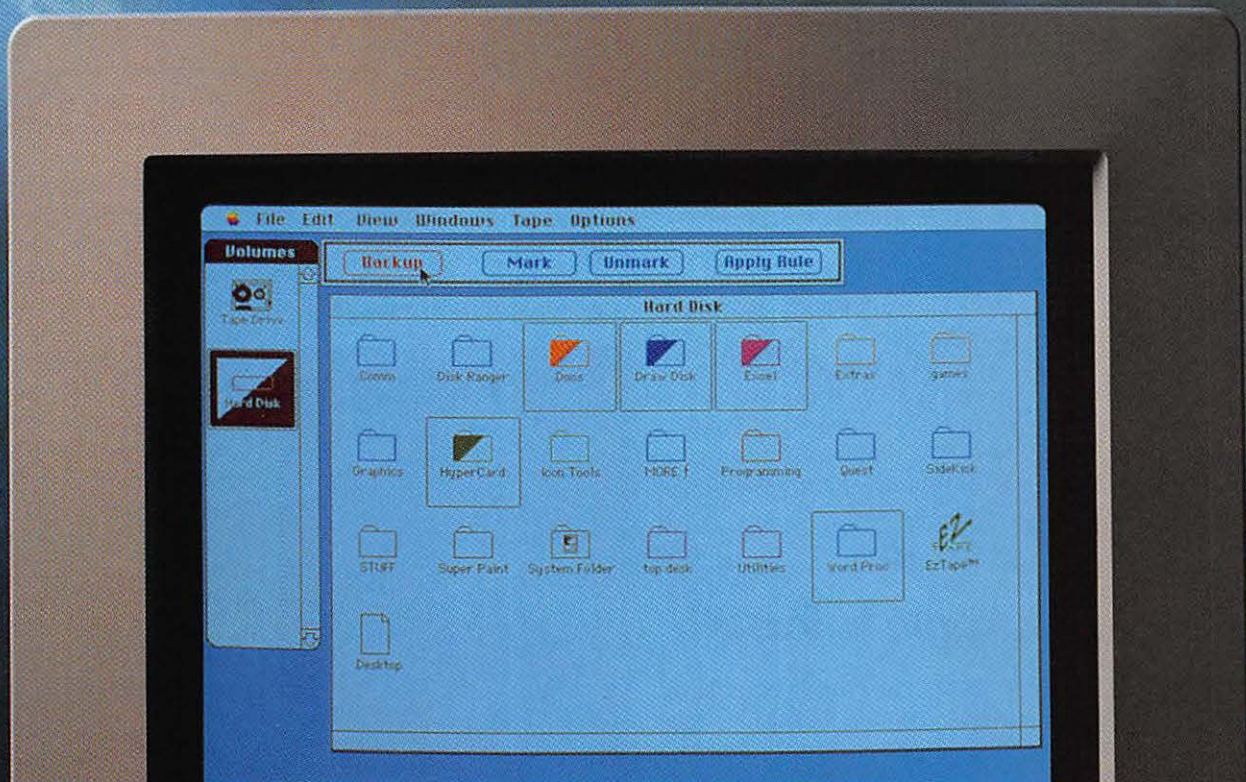


Comprehensive land planning is a massive undertaking that requires lots of maps and huge amounts of data. Numerous public agencies are involved, as well as many private companies. Land planners need to identify parcels and their boundaries, and be able to link large amounts of information to the parcels and then access that information.

Up to now, geographical information systems (GIS) have

(continues)

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Ann Arbor, MI 48105-1531
313/996-3300

Circle 82 on reader service card

existed only on mainframes, minicomputers, or IBM ATs, and have required specialized hardware and software packages often costing as much as \$250,000.

Not any more. ComGrafix has released MapGrafix, a sophisticated GIS that runs on a Mac Plus, Mac SE, or Mac II workstation. Costing \$8500—compared to \$15,000 for its closest microcomputer competitor—MapGrafix is used to analyze fire and emergency services, transportation systems, crime statistics, school districts, zoning patterns, tax mapping, and subdivisions.

One result can be improved emergency services. For instance, a fire chief can enter all medical emergency response runs, categorized by geographic area and cause, to see if certain patterns develop and to make sure the right equipment is on the right vehicles. MapGrafix incorporates complex polygon mapping tools with data encoding, analysis, and display in multiple layers. All data can be displayed in tabular, graphic, or mapped format and can be output to a color-plotter such as the HP 7570A. For more information, call ComGrafix of Clearwater, Florida, at 813/443-6807.

—Barbara Chan



You might call it desktop clothing. Jim Charles of Esprit calls it common sense: designing graphics for garments on a Mac.

Let Them Eat Cloth



While the Macintosh may be the quintessential user-friendly computer, not all business environments greet it with open arms.

Esprit de Corps, a San Francisco-based clothing manufac-

turer, spent over seven million dollars on an office-wide IBM system not too long ago. So when Esprit's director of computer-aided design bought three Macs for his department, he had to "hide" them in other departments in the company.

Little by little, though, the Mac's design potential has been recognized, and now the company is coming to depend on the designs the Mac can produce. Esprit has found that a Macintosh can save a designer hours of tedious, difficult work.

Working mainly with *Adobe Illustrator*, Esprit designs graphics for different clothing items. Esprit also uses the Mac to design fabric construction—how many loops in a certain knit, or the way threads intertwine in a woven cloth.

A new shirt design that reads "Le Cool Beat" was created partly on the Mac before it was transferred to a shirt with puff paint, which produces a soft, bumpy texture. Another shirt designed on the Macintosh—a sporty creation covered with

racing motifs—looks like it belongs on a Tour de France participant.

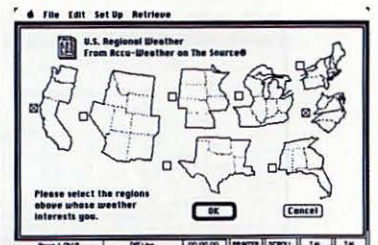
One of the main factors of resistance to the Macs at Esprit was the fear that the machines would replace designers. This worry has been dismissed with the knowledge that artists are still needed to do the actual designing, whether on paper or on a computer screen.

Evidently, its computer diversification has not hurt the quality of design at Esprit. Last year, Esprit was the first private corporation and the first fashion business ever to win the prestigious American Institute of Graphic Arts Design Leadership Award. —Jeanette Borzo

Meet Acknowledge



Recognizing that there are many people who are comfortable with the Mac's interface but don't understand the complexities of navigating an online service (like CompuServe or GENie) or querying a central computer system, SuperMac plans to offer a new communications pro-

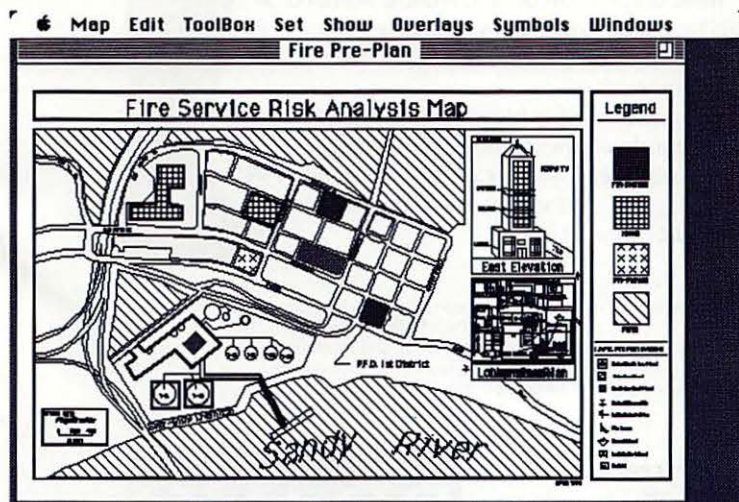


Acknowledge automates many communications tasks, like obtaining weather information.

gram called Acknowledge. It's designed for two groups: experts who program specialized templates, and beginners who will use those templates.

Acknowledge is a development tool that will let program-

(continues)



One of many potential uses for a geographical database is designing more efficient public services—for example, predicting demands on a local fire department.

MacCalc

Speed, Style, Simplicity



Speed

MacCalc is the fastest spreadsheet you can buy, and More Speed gives you Greater Productivity.

"Amazingly speedy...[MacCalc] runs faster than Excel." — *InfoWorld*, November 3, 1986

"Special routines in MacCalc make operations such as entering data and recalculating, opening files, scrolling...faster than Excel." — *Macworld*, December, 1986



Ease

MacCalc is easier to use and learn than any other spreadsheet, and Greater Ease means Less Frustration... "Simplicity is the ultimate sophistication."

"[Working] in MacCalc is easier than in Excel." — *Macworld*, December, 1986

"Designed to be easy to use, and succeeds admirably." — *MACazine*, March, 1987

"MacCalc answers the frustration of Excel users — its carefully planned menu structure makes MacCalc exceptionally easy to use." — *MacWEEK*, June 15, 1987

"Simplicity and ease of use are MacCalc's greatest assets...[seen in] the richness and ease of use embodied in its user interface." — *MACazine*, November, 1987



Looks

MacCalc is the only spreadsheet which allows each cell to have its own format, font, size, and style — allowing high-impact, desktop publishing quality output, and Greater Clarity creates Dramatic Presentations.

"MacCalc offers [the most] flexibility in page and font setup, and has the most printing options." — *Macworld*, December, 1986

"MacCalc lets you dress up your spreadsheet..." — *Publish!*, June, 1987

"MacCalc's formatting features allow your spreadsheet to look more like pages from a finished report...brings the concept of publication-quality spreadsheets closer to reality." — *InfoWorld*, June 22, 1987



Value

At \$139, MacCalc provides the greatest value at about 1/3 the price of Excel.

"The clear value leader." — *InfoWorld*, November 3, 1986

"MacCalc is a spreadsheet package of exceptional value." — *MacWEEK*, June 15, 1987

"The best deal in a spreadsheet package that I've ever come across, bar none." — *MACazine*, November, 1987

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	1987 Tot
East	\$1.2	\$1.3	\$1.7	\$1.5	\$5.7
North West	\$2.0	\$2.2	\$2.7	\$2.6	\$9.5
South West	\$1.9	\$2.2	\$2.2	\$2.3	\$8.6
Central	\$0.8	\$1.0	\$0.9	\$1.0	\$3.7
Totals	\$5.9	\$6.7	\$7.5	\$7.2	\$27.3

Note: 4th Quarter results are estimated.

The Best Spreadsheet — MacUser Editor's Choice Award ➤

"It's faster than either Multiplan or Excel, and once you move [to MacCalc], you're not going to want to move back"

— *Macintosh Buyer's Guide*, Summer, 1987

"...MacCalc is a must-have. The product itself is highly functional, easy to learn and to use, and definitely supports the most visually appealing formatting/printing capabilities." — *MACazine*, November, 1987

"If you are interested in attractive output and value, MacCalc is the spreadsheet for you." — *InfoWorld*, June 22, 1987

Some of MacCalc's special features:

- Minimal recalculation™ technology for great speed
- Natural, powerful editing commands combined with easy to use interface
- Full choice of format, font, size and style in each cell for DTP quality output
- Variable row height and column width
- Cell notes, for audit trails and self-documenting worksheets
- On-Line Help
- Full Undo command
- Reads and writes WKS models (from Lotus 1-2-3 or Excel) and SYLK data
- Paste formatted tables from MacCalc directly into MacWrite or PageMaker documents
- Database sort, search, and fill commands
- Full desk accessory (DA) support and Switcher-compatibility

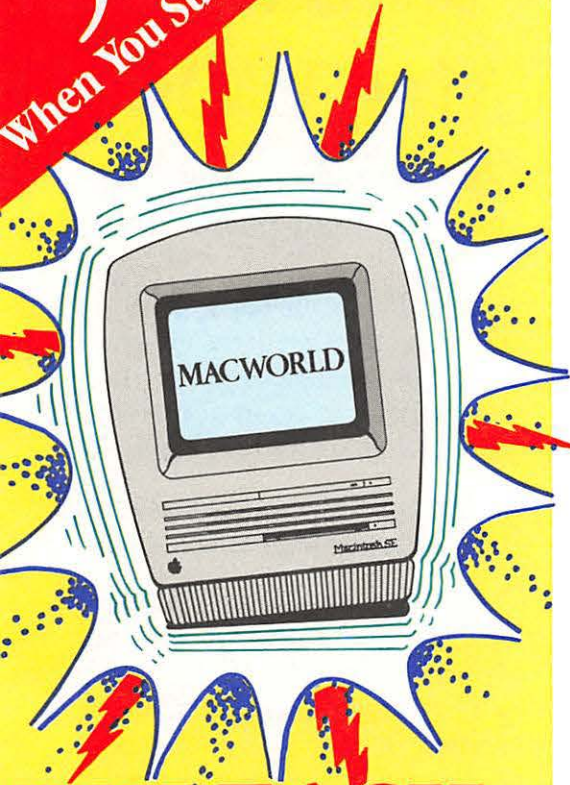
THE BOTTOM LINE: You can buy the slower, more difficult, overpriced, over-featured product from the competition, or you can buy MacCalc, the best spreadsheet for your real needs, for \$139.

For technical, corporate, or dealer information, please call 415/841-8552. MacCalc is available at better dealers everywhere. To order MacCalc directly for \$139 (plus tax in CA), please call our order desk at 800/345-2888 (orders only, please), and have your VISA or MasterCard ready, or write: (Purchase orders cannot be processed.) Bravo Technologies, Inc., c/o DPAS P.O. Box 1, Gilroy, CA 95021-2249. MacCalc® is a registered trademark and minimal recalculation™ is a trademark of Bravo Technologies, Inc. Other product names mentioned above may be trademarks of their respective manufacturers.

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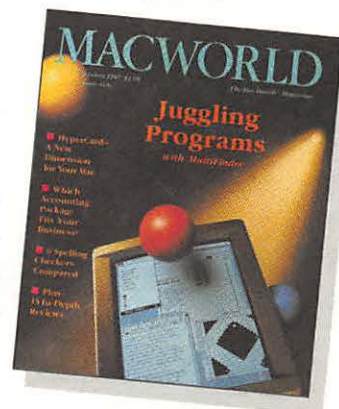
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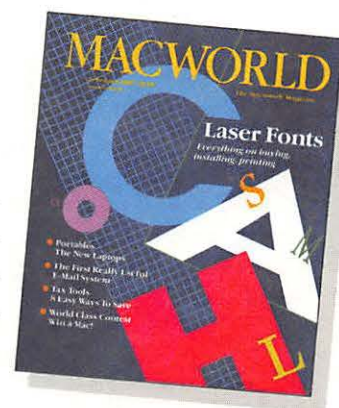
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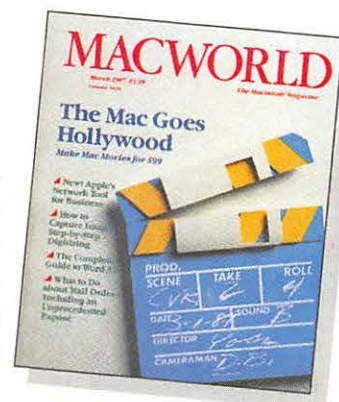
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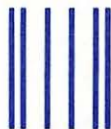
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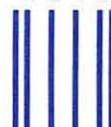
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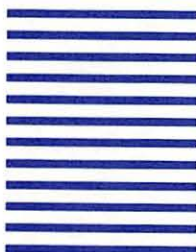
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mers design specialized communications applications to enable users to reach out painlessly for their information. Instead of dealing directly with an online service or a host computer, users will select from one or more applications called *connections*. Each connection performs a specific job, such as looking up investment information or downloading E-mail or files. In most cases, users should be completely insulated from the burdensome tasks of telecommunicating. At the very least, they'll receive prompts or online help designed by the developer.

Acknowledge developers use Telecommunications Access Language (TAL), a high-level language like Pascal or BASIC, to create their own connections. TAL's most important feature lets programmers control the appearance of everything the user sees while communicating. As a result, programmers can essentially repackage the appearance of an online

service so that users see familiar Macintosh features, such as dialog boxes and menus, instead of complex commands.

Currently Acknowledge can only handle asynchronous serial communications, so developers can't as yet write connections for networks that contain IBM mainframes. Acknowledge's suggested retail price will be under \$500, and it should be available this summer. For further information, call SuperMac in Mountain View, California, at 415/964-8884.

—Adrian Mello

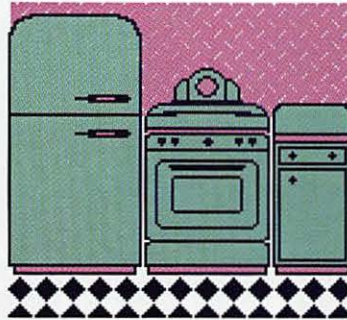
Vertical CAD



With at least a dozen general-purpose CAD programs now available for the Mac, it's logical that CAD software developers will differentiate themselves by focusing on vertical design markets. One of the first such

applications is Planit, a 3-D kitchen-design program for retailers of kitchen components.

Planit includes a library of cabinets, shelves, doors, windows, and appliances, so the retailer can design a kitchen on the Mac and show the plan to a



client. The client's suggestions can be added to the on-screen model, which can be viewed from a number of perspectives at any scale. Once a design is approved, the final plan is output to a plotter or a color printer, either as a wire-frame drawing or more realistically, with hidden lines removed and surfaces shaded.

Planit is more than just a visual aid, however. A price list linked to the components generates a table detailing the cost of each item, helping the retailer prepare a quotation and an invoice. If the designer alters a drawing—changing the brand or size of a cabinet, for example—Planit updates the related table of prices accordingly. Retailers can use the parts catalogs provided with Planit or create their own.

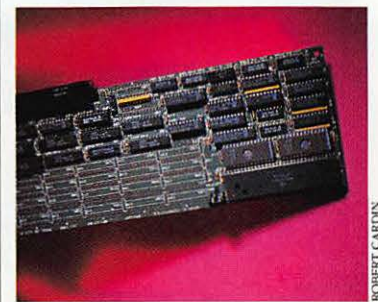
The program includes a variety of error-checking features. For example, if you insert a cupboard that obscures part of a window, or if you place the stove so a door hits it when opened, Planit informs you of the mistake. Planit also includes thoughtful touches such as a library of graphic items—tables, chairs, saucepans, plants, and other accessories that help bring drawings to life. A color version of Planit should be available soon.

Planit was created by ICADS, a British software developer, and is distributed in the United States by CompServCo. The program sells for \$2250, or \$3500 including the cost-detailing module. For further information, contact CompServCo in Slidell, Louisiana, at 504/649-0484.—Erfert Nielson

The Mac's Connectivity Grows



Instead of waiting for the Mac to be accepted by corporate America's computer purchasers, Apple has resorted to an "octopus strategy"—reaching out for every possible connection with other computers. First, it grabbed IBM's personal computers using AppleTalk-based networks like AppleShare and TOPS. Next it fostered file translation with the MS-DOS world and such computers as Wang. And then it struck a strategic agreement with Digital Equip-



Apple's MacAPPC board is a key link in connecting Mac IIs to IBM mainframes.

ment Corporation, the second-largest computer maker in the United States.

Now Apple is latching onto IBM's mainframes using a hardware/software combination called MacAPPC (Advanced

(continues)



Robert Coulling developed a kitchen-design program that's practical and fun. He plans to expand the program's capabilities to include other rooms and buildings.



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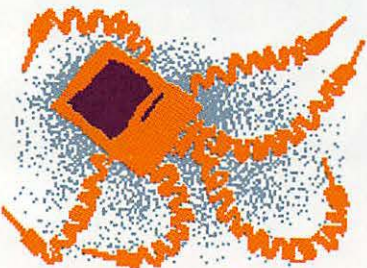
MacDraw, MacPaint and Macintosh are trademarks of Apple Computer Inc. 4th Dimension is a trademark of Acius, Inc. Excel is a trademark of Microsoft Corp. More is a trademark of Living Videotext, Inc. SuperPaint is a trademark of Silicon Beach Software, Inc. GraphicWorks is a trademark of Mindscape, Inc. FullPaint is a trademark of Ann Arbor Software, Inc.

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Program-to-Program Communications), which consists of a Mac II with a coprocessor card as an AppleTalk gateway. To this system you connect other Macs, which can then easily access IBM mainframe data.

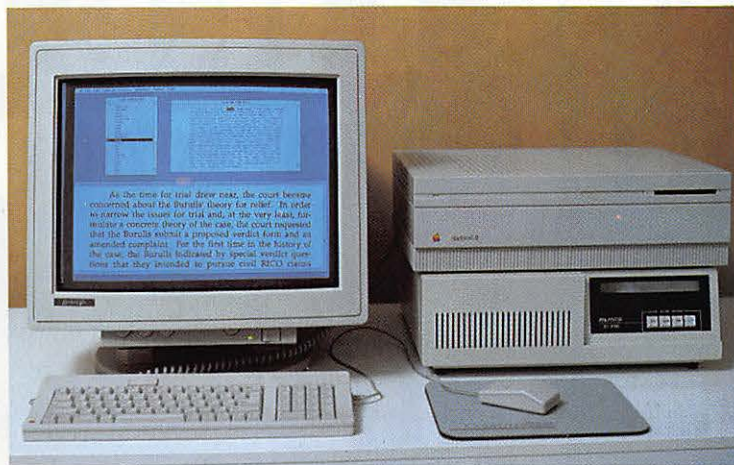
This setup opens the door to new Mac applications that will run distributed databases and perform transaction processing and cooperative processing within the IBM framework. Many of these new programs will be developed using another new Apple "arm" called MacWorkStation, which allows mainframe programs to look and feel like normal Macintosh applications. Targeting corporate management information services departments, MacWorkStation makes it much easier for programming staffs to provide an easy-to-use Mac interface to their existing programs.

Supplementing Apple's own announcements, two companies have demonstrated their



own tools for new links between Macs and other computers. Touch Communications' OSI Macintosh Developer's Kit easily transfers files between Macs, PCs, VAXs, and Sun workstations using the OSI series of networking protocols. Network Innovations' CL/I is a *connectivity language* that will enable Mac users to access both SQL databases and regular flat files on VAX computers.

For more information, call Touch Communications in Scotts Valley, California, at 408/438-4800 or Network Innovation in Cupertino, California, at 408/257-6800.—David R. Kosiur



Palantir's Recognition Server, right, quickly converts great quantities of printed information into Mac files.

OCR in Three Seconds

ABC DEF HIJ For years, people dealing with lots of paper documents have been interested in optical character recognition (OCR), which has promised easy conversion of type to computer files.

Now Palantir is offering the Recognition Server, which reads a page of copy into a Macintosh in only three seconds. In addition, the Recognition Server never needs to be taught a font. It stores and manipulates graphic elements, recognizes forms (lifting only the required data from the recognized form), and can usually complete its tasks unattended.

All this is possible using hardware based on five Motorola 68020 processors (the Mac II uses only one 68020) and software developed by Conversion Dynamics, which has written similar programs to use the Recognition Server with Sun workstations and IBM PC ATs.

The Recognition Server forms an integral part of the Micro Dynamics MultiUser Archival and Retrieval System (MARS), which could be useful to anyone who must store large

amounts of information but retain the ability to access it instantly. A typical use would be for a group of lawyers who want to store briefs and trial transcripts and then search for all occurrences of a particular, precedent-setting case.

By itself, Palantir's Recognition Server lists for \$25,500—a complete MARS can run over \$100,000. Some may be able to afford such prices, but for the rest of us, OCRs installed in service bureaus could prove economical in producing Macintosh word processing files.

For further information, call Palantir Corporation in Santa Clara, California, at 408/986-8006 or Micro Dynamics in Silver Spring, Maryland, at 301/589-6300.—Scott Beamer

HYPERCARD

HyperCard Resources



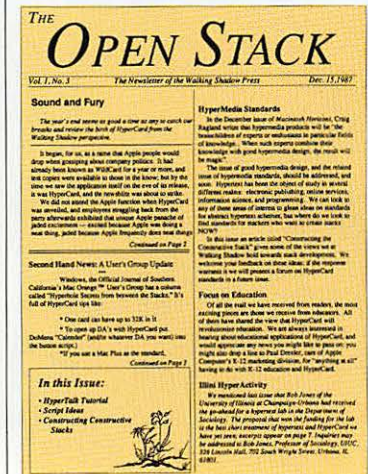
An onslaught of HyperCard resources has accompanied consumer acceptance of Bill Atkinson's information construction set. Here are some of the textbooks, magazines, and newsletters that

are sprouting up faster than rainy day mushrooms in a soggy field.

HyperAge is a glossy magazine that hustled up some HyperCard heavyweights (with Ted Nelson as prophet) for its first issue. Lots of attention to script writing. \$3.95 cover price. *HyperAge*, 5793 Tyndall Ave., Riverdale, NY 10471.

HyperLink, another glossy magazine on the same subject, markets a disk containing the software covered in each issue. Cover price is \$4.95. *HyperLink Magazine*, P.O. Box 7723, Eugene, OR 97401.

Open Stack is a free monthly newsletter from the publisher of Jeff Stoddard's book *HyperCard Scripting*. A mix of editorial and script-writing ideas



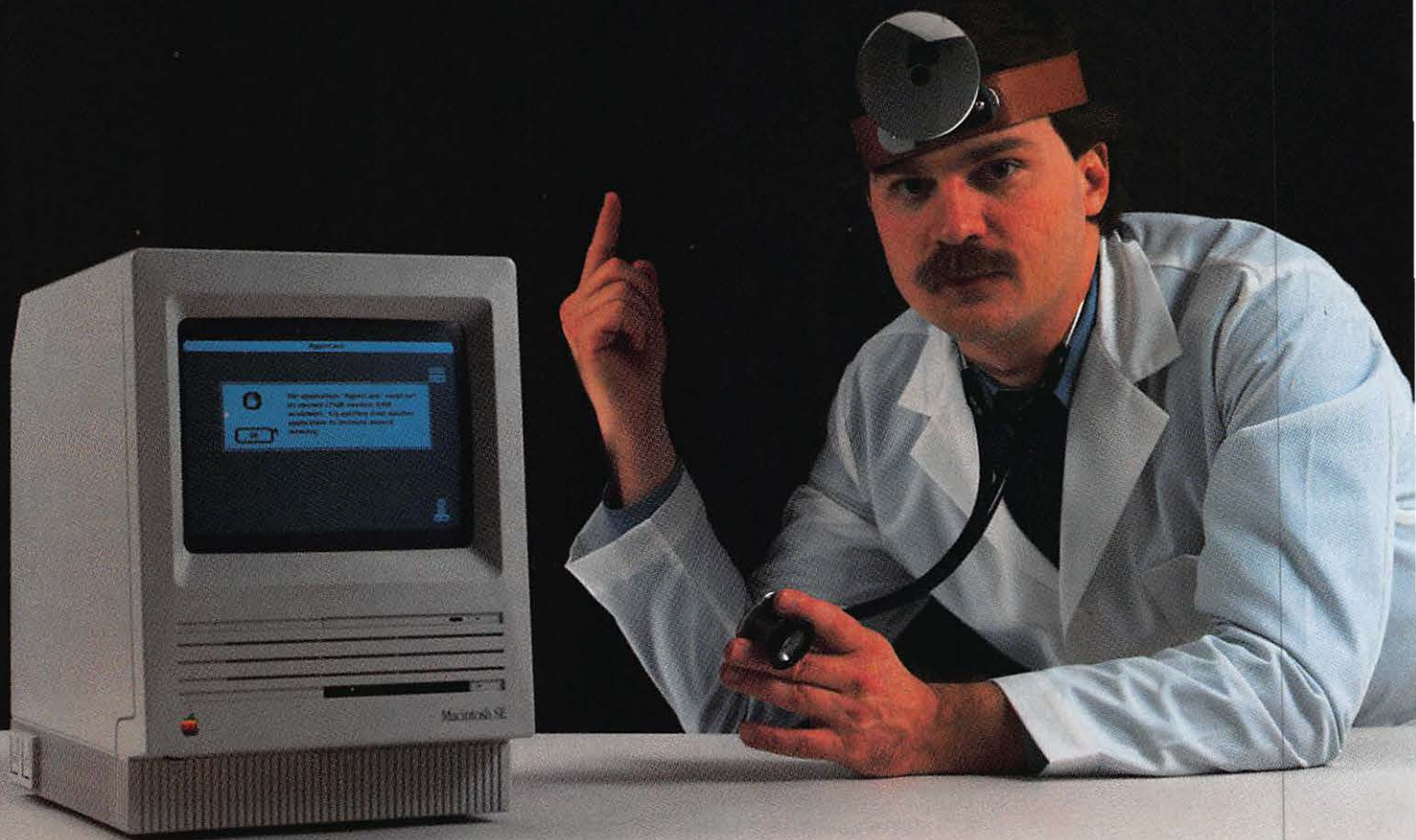
The Open Stack is one of several new publications that reveal HyperCard innovations.

on nice, thick paper. Walking Shadow Press, P.O. Box 2092, Saratoga, CA 95071.

Mac Phone Book is a free disk available to people who send in a blank, formatted 800K disk and a self-addressed stamped envelope. It contains lists of Macintosh vendors, user groups, and publications, as well as tips and classified ads. Mac Phone Book, P.O. Box 82071, Phoenix, AZ 85071.

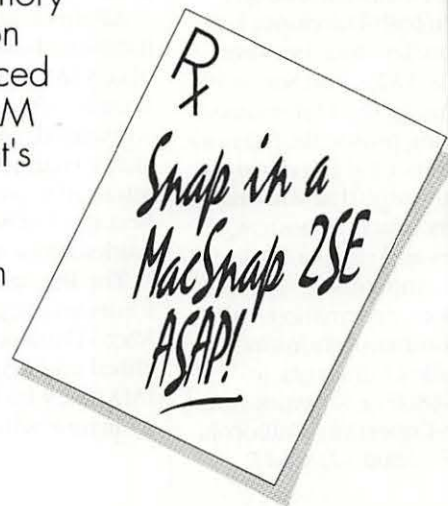
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HyperWise is a monthly journal for programmers; it covers technical matters and industry news. \$129 for 12 issues. The Comtech Group, Inc., 1520 York Ave., Rm. 25G, New York, NY 10028.

The Stack Exchange Catalog is a disk that contains a list and sampling of Heizer-distributed commercial programs and stacks. \$2. Heizer Software, 1941 Oak Park Blvd., Ste. 30, Pleasant Hill, CA 94523.

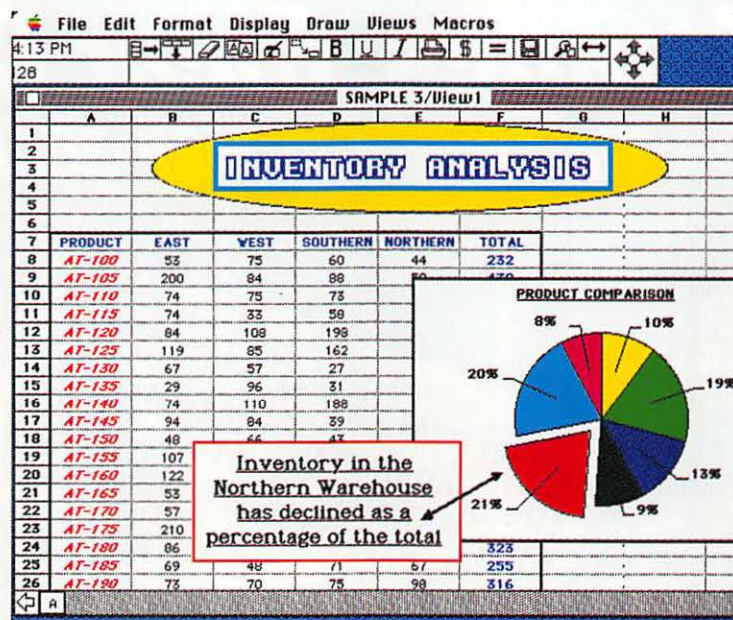
Atkinson's Army's Hyper Catalog is a stack that catalogs all the public domain and shareware stacks available through the Berkeley Macintosh User Group. Send \$3 for the Hyper Catalog disk to: BMUG, 1442A Walnut St., #62, Berkeley, CA 94709.—Scott Kronick

Challenging Excel



Ashton-Tate's new spreadsheet, Full Impact, is Excel's first direct competition from a heavy-weight software house. It's also the first spreadsheet specifically designed for the Mac II.

Full Impact incorporates a limited word processor that allows you to add a full page of text to a spreadsheet and to integrate text and data (and graphs) on a page, with complete font and size control over all cells. To make layout easier, Full Impact has several page-previewing modes, like zoom, enlarge, and reduce. Finally, Full Impact spreadsheets can grow to 524,000 cells using virtual memory. However, since virtual memory means treating disk space as if it were continuous RAM, those large disk-based spreadsheets will run more slowly for many operations.



Ashton-Tate's Full Impact spreadsheet program is the first major competition for Microsoft's Excel. It offers text, data, and color graphics capabilities.

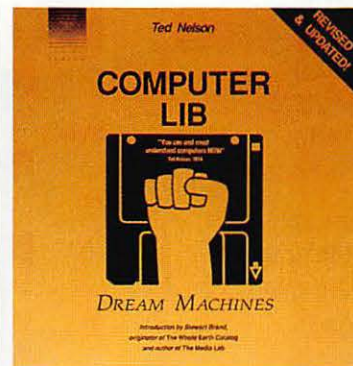
The program offers simplified charting with dynamic resizing and automatic updating of graphs. Macro capability in Full Impact allows both global and local macros (local macros affect only specific spreadsheets), full macro editing, and an extended macro language. Other features include automatic file saving and seamless file exchange between most Mac and PC formats.

Although Full Impact requires only 1 megabyte of RAM and two 800K drives for a minimum configuration, many of its high-end graphing and display features call for a Mac II. In particular, Ashton-Tate has supported cell-by-cell color control and page-layout operations that really demand a large color monitor. It's not necessarily the spreadsheet "for the rest of us," but it's a commanding presence in an office setting. Priced at \$395, Full Impact is scheduled to be released on July 31. For more information, call Ashton-Tate in Torrance, California, at 213/329-8000.—Charles Seiter

A Classic Revisited



Of the numerous self-descriptions Ted Nelson provides in his book *Computer Lib/Dream Machines*, the one that sticks with me is "Renaissance Wacko." This title hints at the breadth, the brilliance, the eccentricity, and the sometimes infuriating intransigence in store for Nelson's readers, new and old.



Ted Nelson's past predictions often proved correct—now he updates his view of the future.

When Nelson first self-published this two-books-in-one package in 1974, he was an angry maverick—an outsider with the temerity to insist that computer power belonged to people, and a visionary who suggested how people might get hold of that power. The happy surprise in this new edition by Microsoft Press (1987) is that Nelson is still an angry maverick, despite the fact that many of his original radical postures have been widely accepted.

Nelson's personal hobby-horse is hypertext, and he rapturously describes how this will improve our lives (especially if we use Nelson's own proposed Xanadu hypertext system). He also has some words about the Macintosh: he calls it a "yuppie-craftsy computer," though he generally approves of it as an interim step to the super-machines of the future.

But do not buy *Computer Lib/Dream Machines* for such a parochial reason as wondering what he says about the computers of today. Buy it to thumb through, enjoy the scribbly graphics, chortle at its embedded jokes, gasp at its political tirades, and above all, be inspired by Ted Nelson's utopian computer fantasies.

—Steven Levy

Grand Finale



Finale is the second-generation music-processing program that most everyone interested in music has been waiting for. It's a true expert system that's appropriate for arrangers, orchestrators, engravers, music publishers, and composers—both amateur and professional.

(continues)

Clear Images. Clear Choice.

The Microtek MSF-300C Scanner.



Meet Marsha Lyon. Marsha coordinates and creates in-house publications for *Allergan, Inc.*, the world's leader in eye-care products. She uses the **Microtek MSF-300C Desktop Scanner** because it gives her complete control over her desktop publishing.

Instead of sending out images to be halftoned, Marsha can scan photos in up to 64 shades of gray using any one of 8 halftone patterns. Unlike all other scanners, the MSF-300C has 15 independent brightness and contrast settings to compensate for imperfect photos, drawings or logos. And its quick and accurate OCR capability eliminates the tedious re-keying of lengthy documents.

"Now, I get sharp, clear images and text that improve the look of my publications." But don't just take Marsha's word for it, *PC Magazine* awarded the MSF-300C its Editor's Choice.

So, if you have an Apple Macintosh, an IBM PC or PS/2, find out how to get a Microtek scanner of your own. Call (213) 321-2121 in California, or 1-800-654-4160 for your local authorized Microtek dealer.

MICROTEK

16901 South Western Avenue
Gardena, California 90247

Circle 585 on reader service card





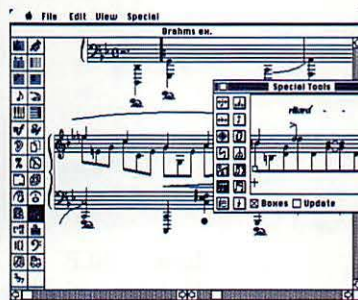
Finale's impressive capabilities are revealed in the depth of its features, which begin with production of impeccable notation from music played on a MIDI instrument. It accurately

tracks right and left hands and intricate rhythmic polyphonies, displays the actual music notation while you play, and automatically determines complex guitar chords and plays them back, correctly voiced.

All of a notation's dynamics, articulations, and expressive markings are interpreted during playback. The program includes a built-in PostScript symbol designer—each new symbol can generate any MIDI effect upon playback. An innovative editing operation called *mirroring* links copies or vari-

ations of melodies to their sources so that changes in the original are reflected in the repetitions, anywhere in the piece.

Finale's PostScript-printed output meets the highest standards of professional publishing. You can even configure it to replicate various styles of



Finale will produce musical notation as music is played on any MIDI instrument.

music-printing developed over the past hundred years. Finale's input, editing, and playback cycle is about 30 percent faster than other programs' and virtually eliminates the need for MIDI sequencers because the music's dynamics are controlled through detailed notation.

Coda Music Software will be charging \$1000 for Finale when it's released this month. After testing Finale for several months, I believe its effect on music will be equal to the impact the invention of the printing press had upon text. For further information, call Coda in Bloomington, Minnesota, at 800/843-1337. —*Christopher Yavelow*

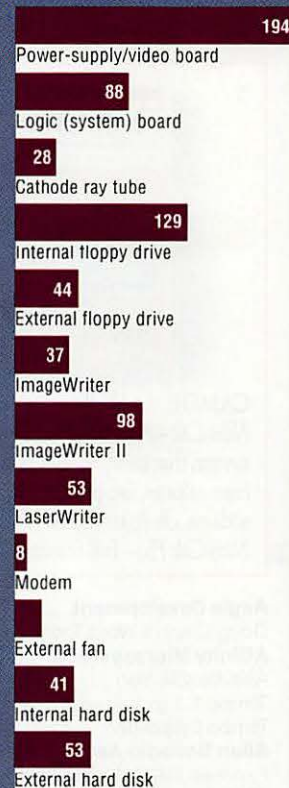
Macworld News: Readers' Views



This month's survey focuses on service requirements for Macintosh components. *Macworld News: Readers' Views* is based on a survey of 1000 randomly

selected *Macworld* subscribers, from which we received 504 responses. Of those who responded, 277 readers had required repair service for at least one Macintosh component. This chart represents repair totals for individual parts, including cases in which a single component underwent multiple repairs. Note the frequency with which the Mac's power-supply/video board required service—a total of 194 times.

We welcome your ideas for future *Macworld News: Readers' Views* surveys. Please send your suggestions to: News Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. Your ideas are important to us. □



The number of times that individual Macintosh components needed repairs.

Your Best Stacks



Welcome to "Your Best Stacks," a look at the best stacks submitted to *Macworld* by its readers. I run an all-Mac BBS in Cupertino, California, and have been very active in HyperCard authoring and use. I see and use a large number of stacks each week, and I will try to use that exposure as I evaluate the stacks submitted to *Macworld*.

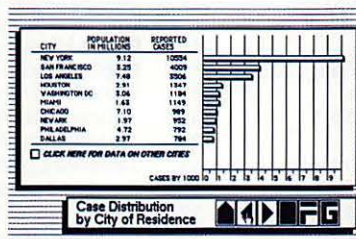
My first pick is a help stack for the drafting program VersaCAD. This stack presents the VersaCAD menus. Select a menu item and you get an explanation of it. It's fast, easy to use, and absolutely intuitive.

The AIDS Stack, by graphic designer Michael Tidmus of Artsavant Desktop Publishing, effectively uses graphics to convey an important and compelling message about the spread of AIDS. It's one of the best examples of hyperware I've seen.

Another graphically oriented education stack, Cell Biology, is by Russ Doren of Cherry Creek High School in Englewood, Colorado. The stack describes cell biology and even includes

animated sequences of cells dividing.

I'm no opera fan, but a stack called Parsifal, by Jay M. Anderson, held my attention for over an hour. It's actually a collection of three interrelated Hy-



Michael Tidmus designed an attractive HyperCard stack for educating people about AIDS.

perCard stacks using digitized music, text, and graphics to describe the opera *Parsifal* by Richard Wagner.

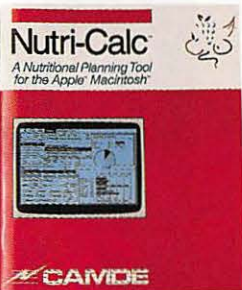
The stacks described above are generally available on commercial information services and local BBSs. If the stacks are shareware or freeware, I will post them on my BBS at 408/253-3926 and on Portal Communications at 408/725-0561. Please send your HyperCard stacks to *Macworld*. I see lots of good stacks but unfortunately I can't include them here unless they are submitted. —*Bob Murrow*

No zig. No zag.

SOFTWARE

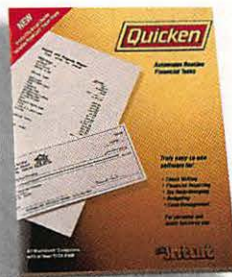
NCP denotes not copy-protected.
CP denotes copy-protected.

Aba Software ... NCP
"Draw it again, Sam" (paint program) ... \$89.
Access Technology ... NCP
Trapeze 2.0 (spreadsheet & graphics) ... 159.
Activision ... NCP
Postcards (clip-art, card stock) ... 20.
Business Class (atlas, req. Hypercard) ... 30.
City to City (req. Hypercard) ... 30.
Focal Point (organizer, req. Hypercard) ... 59.
Reports! (report generator, req. Hypercard) 59.
Adobe Systems ... NCP
Adobe Illustrator ... 349.
Adobe Type Library ... partial listing
ITC Garamond ... 129.
Helvetica Light/Black ... 129.
Aachen, Review ... 129.
Helvetica Condensed ... 259.
Newsletters (Century Old Style, ITC Franklin Gothic, ITC Galliard) ... 279.



CAMDE ... NCP
Nutri-Cal—A flexible nutritional analysis system that easily monitors intake of 8 nutrients: calories, fat, protein, carbohydrates, sodium, cholesterol, iron & vitamin C ... \$39.
Nutri-Cal Plus—Full-featured ... 175.

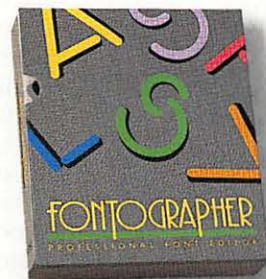
Aegis Development ... NCP
Doug Clapp's Word Tools ... 42.
Affinity Microsystems ... NCP
Affinifile (DA filer) ... 46.
Tempo 1.2 (power user's macro utility) ... 52.
Tempo II (updated, auto installation) ... 89.
Allan Bonadio Associates ... NCP
Expressionist 1.1 (equation processor) ... 46.
ALSoft ... NCP
DiskExpress (maximize disk performance) ... 26.
Font/DA Juggler Plus (w/sound utility) ... 32.
Altsys ... NCP
FONtastic Plus (advanced font editor) ... 47.
Fontographer (LaserWriter font editor) ... 239.
Ann Arbor ... NCP
FullPaint (advanced Paint program) ... 49.
Ashton-Tate ... NCP
dBASE Mac 1.0 (relational, req. MacPlus) 295.
Batteries Included ... NCP
Thunder! 1.1 (spelling checker) ... 30.
Berkeley System Design ... NCP
Stepping Out (screen extender) ... 54.
Blyth ... NCP
Omnis 3 Plus/Express (database) ... 275.



Intuit ... NCP
Quicken—Complete easy-to-use personal accounting package. Includes budgeting, check writing, tax recordkeeping, and cash management ... \$35.

Omnis 3 Plus/Express (2-5 users) ... 489.
Bogas Productions ... NCP
Studio Session (music creation) ... 49.
Country or Heavy Metal Rock Disk ... 15.
Borland International ... NCP
Turbo Pascal Tutor ... 49.
Sidekick 2.0 (includes MacPlan) ... 59.
Numerical Methods Toolbox ... 65.
Turbo Pascal (HFS compatible) ... 65.
Eureka: The Solver ... 129.
Reflex Plus (info management tool) ... 165.
BrainPower ... NCP
StatView (statistics package) ... 32.
Graphindex (DA graphics organizer) ... 49.
DesignScope (electronic circuit design) ... 128.
MathView Professional (num. analysis) ... 145.
StatView 512+ (full-featured) ... 175.
Bravo Technologies ... NCP
MacCalc (easy to use spreadsheet) ... 79.
Bright Star Technology ... NCP
Alphabet Blocks (teaches phonetic sounds) ... 39.
Broderbund ... CP
Jam Session (create your own tunes) ... 30.
Print Shop (create cards and memos) ... 36.
Geometry (over 350 problems!) ... 60.
Physics (over 300 problems!) ... 60.
CAMDE ... NCP
Nutri-Cal (diet & nutrition analysis) ... 39.
Nutri-Cal Plus (full-featured program) ... 175.
CasadyWare ... NCP
Fluent Fonts (two-disk set) ... 27.
Fluent Laser Fonts (Vols. 1-18) ... each 64.
CE Software ... NCP
Calendar Maker (create custom calendars) ... 32.
Disktop 3.0 (powerful DA Finder) ... 32.
QuickKeys (reduce mouse movements) ... 64.
Challenger Software ... NCP
Mac3D (3D graphics, CAD features) ... 126.
Chang Labs ... NCP
Rags to Riches Led., Pay., or Rec. ... 120.
C.A.T. (contacts, activities, time) ... 239.
Inventory Control or Professional Billing ... 239.
Professional or Retail Business 3 Pak. ... 359.
Cortland ... CP
TopDesk 2.3 (7 new desk accessories) ... 32.
Cricket Software ... NCP
Pict-O-Graph (color on the Mac II) ... 105.
Cricket Graph (multiple windows) ... 119.

Cricket Draw (advanced draw capabilities) \$169.
Cricket Presents (MacPlus, SE & II) ... 289.
DataViz ... NCP
MacLink Plus (transfer Mac/IBM data) ... 145.
Davidson ... CP
Math Blaster! (grades 1-6) ... 27.
Deneba Software ... NCP
Merriam-Webster's Thesaurus ... 36.
Comment (electronic Post-It notes) ... 56.
Canvas DA (contains 80% of Canvas) ... 56.
Canvas 1.0 (includes desk accessory) ... 109.
Coach (interactive spell checker) ... 56.
Coach Professional ... 109.
Dove Computer ... NCP
RAMSnap (RAM Disk/Disk Cache) ... 21.
Dow Jones ... CP
Desktop Express (documents via MCI mail) 95.
Market Manager Plus (portfolio mgmt.) ... 195.
Dubl-Click Software ... NCP
Calculator Construction Set ... 36.
World-Class Fonts! (both volumes) ... 36.
WetPaint Clip Art (both volumes) ... 36.
Electronic Arts ... NCP
Disk Tools Plus (8 DAs plus tools) ... 32.
Deluxe Music Construction Set 2.0 ... 61.
Enabling Technologies ... NCP
Easy3D (create solid 3D objects) ... 79.
Pro 3D (3D shaded modeling) ... 199.
Enzan-Hoshigumi USA ... NCP
MacCalligraphy (create unique designs) ... 115.
Year of the Dragon (clip art) ... 21.
Japanese Clip Art Scroll 1 "Heaven" ... 59.
Japanese Clip Art Scroll 2 "Earth" ... 59.
Japanese Clip Art "Borders" Scroll ... 69.
Farallon Computing ... NCP
MacRecorder™ Sound System ... 149.
Fifth Generation Systems ... NCP
FastBack Mac (powerful backup utility) ... 59.
1st Byte ... CP
Mad Libs (w/synthesized speech) ... 14.
First Shapes, KidTalk, MathTalk Fractions, MathTalk, SmoothTalker, Speller Bee ... each 32.
Forethought ... NCP
Factfinder 1.1 (information organizer) ... 35.
FileMaker 1.0 (custom design reports) ... 39.
Foundation Publishing ... NCP
Comic People (create your own characters) 25.
Comic Strip Factory (create cartoons) ... 45.



Altsys ... NCP
Fontographer—Create your own downloadable PostScript® fonts, logos, etc! Includes Bezier curves, spacing tools, everything you'll need. Just add imagination ... \$239.



“There has to be a catch!”

“Dear MacConnection,

“You usually answer the phone on the *first or second ring!* You *never* put me on hold for more than 30 seconds! All this **PLUS** a toll-free number to boot!! And, just about the best price anywhere in the U.S. of A.!!!

“What!!!!... Only \$3.00 *total* shipping charges for OVERNIGHT SHIPPING??? I order a

System Saver Mac on a Tuesday and sign for the damn thing on Wednesday! *LESS* than 24 hours later! You’ve got to be kidding me!!! There has to be catch!!

“Well yes, there is one catch. Once you’ve ordered something from MacConnection, you’ll never order *anything* from anyone else again. It’s that simple.

“I love you people!”

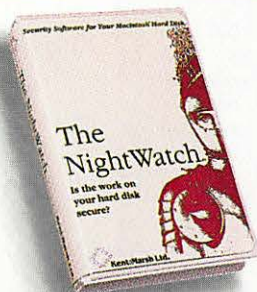
Jeff Woodcock
Brea, California

MacConnectionTM

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for a \$3 tag.

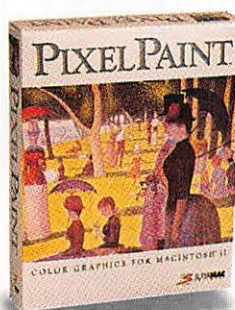


Kent Marsh ... NCP
The NightWatch—Keep people from traipsing through your hard disk while you're away. Provides startup password protection. An elegant & ingenious solution for security concerns ... **\$99.**

TaxView Planner 1987-1991	49.
Software Discoveries ... NCP	
Merge Write (MacWrite mail merge)	35.
Record Holder Plus (data manager)	45.
Software Supply ... NCP	
Suitcase (font and DA utility)	37.
PowerStation (alternative to Finder)	37.
Software Ventures ... NCP	
Microphone 1.1 (includes Glue™)	119.
Microphone II (MultiFinder compatible)	229.
Solutions, Inc. ... NCP	
SmartScrap & The Clipper	35.
SuperGlue (total graphic integration)	52.
The Curator (access your artwork)	79.
Springboard ... CP	
Art a la Mac Volume 1 or 2 (NCP)	23.
Early Games (counting, shapes, ages 2-6)	28.
Easy as ABC (alphabet, ages 3-6)	28.
Certificate Maker (over 200 certificates)	34.
Certificate Library Vol. 1	18.
SuperMac Software ... NCP	
SuperSpool 3.4 (very fast, top-rated)	54.
SuperLaserSpool	82.
Multi-User SuperLaserSpool	199.
Diskfit (backup & restore utility)	54.
Network Diskfit (automatic back up)	205.
Sentinel (encryption)	155.
PixelPaint (color Paint program)	259.
Survivor Software ... NCP	
MacMoney (personal finance)	62.
Symmetry ... NCP	
Acta 2.0 (outline/writing desk accessory)	36.
HyperDA (access Hypercard stacks)	42.
PictureBase 1.2 (clip art manager, 512k)	58.
3G Graphics ... NCP	
Images with Impact (PostScript® clip-art)	65.
Target ... NCP	
Scoop (composition & page layout)	289.
Think Educational ... CP	
MacEdge II (math & reading)	28.
Mind Over Mac (memory & strategy games)	28.
THINK Technologies ... NCP	
HFS Navigator (search for buried files)	34.
Laserspeed (LaserWriter utility)	55.
Lightspeed Pascal	65.
Lightspeed C (top-rated C Compiler)	95.
CAPP's for Lightspeed C or Pascal	49.
InBox Starter Kit (CP)	199.

InBox Personal Connection (Mac or PC) ... call

T/Maker ... NCP	
ClickArt Personal Graphics, Effects, Publications, Letters Vol. 1 or 2,	
Holidays, Business Images	each 28.
Christian Images	35.
Bombay, Plymouth, or Seville Laser font	45.
EPS Illustrations (over 3 Meg's worth)	79.
Write Now (word processor)	98.
TML Systems ... NCP	
TML Pascal (compiler, req. 512k)	59.
TOPS ... CP	
TOPS Teleconnector (DIN8 or DB9)	45.
TOPS (file-server/LAN software)	119.
NET PRINT (formerly TOPS PRINT)	119.
TOPS for the PC	119.
TOPS Flashcard (network add-in card)	169.
Traveling Software ... NCP	
LAP-LINK Mac (connect Mac to IBM-PC)	85.
True BASIC ... NCP	
LANGUAGE & TOOLKIT	
True BASIC (interpreter & compiler)	119.
3D Graphics Toolkit	49.
Other Toolkits (Sorting & Searching or Advanced String)	49.



SuperMac Software ... NCP
PixelPaint—Work with 256 colors at a time from a choice of over 16 million colors. Special effects mode allows for smooth blends & color bursts. Picasso should have had it so good. **\$259.**

EDUCATIONAL SOFTWARE	
Algebra I or II, Pre-Calculus, Trigonometry, Discrete Math, Probability, Calculus, Arithmetic & MacFunction	each 35.
TrueSTAT (statistics)	58.
Turner Hall ... NCP	
MacSQZ (use w/Microsoft Excel)	49.
Unicorn ... CP	
Animal Kingdom (ages 6-12)	27.
Decimal Dungeon (math, ages 9 and up)	27.
Fraction Action (arcade style math game)	27.
Mac Robots (pre-school program)	27.
Math Wizard (math games, ages 5-10)	27.
Read-A-Rama (reading, ages 5-8)	32.
William & Macias ... NCP	
DiskFinder (DA disk catalog)	29.
myDiskLabeler w/Color (req. ImageWriter II)	31.
myDiskLabeler w/LaserWriter option	34.
Working Software ... NCP	
Lookup (90,000 word dictionary)	29.
Findswell (locate documents fast)	29.
Spellswell (spelling checker)	42.
Spellswell Legal or Medical Dictionary	56.

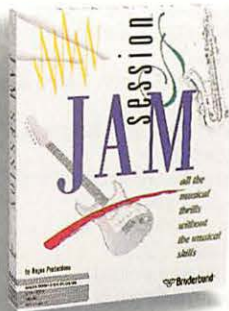
GAMES

Accolade ... CP	
Hardball (baseball simulation)	\$23.
Activision ... CP	
Tass Times in Tonetown	21.
Shanghai (Mah Jongg strategy)	24.
Portal (sci-fi novel)	30.
Addison-Wesley ... CP	
Puppy Love (you and your dog will love it!)	19.
Ann Arbor ... CP	
Grid Wars (3D arcade)	special 19.
Avalon Hill ... CP	
MacPro Football (req. 1 Meg)	28.
MacPro Football 1985 Team	16.
MacPro Football Greatest Seasons	16.
Baudville ... CP	
Guitar Wizard (learning tool for guitar)	22.
Ted Bear's Rainy Day Games	22.
Blue Chip ... CP	
Millionaire (stock market simulation)	35.
Broderbund Software ... CP	
Lode Runner (over 150 levels)	24.
Ultima III (fantasy adventure)	24.
Ancient Art of War (military strategy)	27.
Toy Shop (create working models)	30.
Bullseye ... CP	
Ferrari Grand Prix (Formula One racing)	32.
Fokker TriPlane Flight Simulator	32.
Electronic Arts ... CP	
Skyfox, Pinball Construction Set,	
Dr J vs Larry Bird	each 15.
Ogre (tank simulation)	20.
Patton vs Rommel or Scrabble	27.
Chessmaster 2000	28.
Epyx ... CP	
Sub Battle Simulator (NCP)	24.
Winter Games (Olympic events)	24.
Greene, Inc. ... CP	
Crystal Quest (top-rated color arcade)	24.
Hayden Software ... CP	
Sargon III (9 levels of chess)	29.
Infinity Software ... CP	
Go (4000-year-old strategy game)	27.
Grand Slam (tennis, req. 512k)	27.
Infocom ... CP	
Leather Goddesses, Nord & Bert,	
Bureaucracy, Hollywood Hyjinx	each 24.



3G Graphics ... NCP
Images With Impact: Graphics and Symbols 1—Put more impact into your messages and choose from a portfolio of over 60 PostScript® images in a variety of categories. **\$65.**

Overnight delivery



Broderbund ... CP

Jam Session—Pre-written songs and animated on-screen band make it easy as 1) choosing a musical style, 2) pressing a key, and 3) receiving your Grammy! ... \$30.

FWB Software ... NCP

Hard Disk Partition ... 45.
Hard Disk Util (program backup) ... 54.

Great Wave Software ... NCP

TimeMasters (learn about time, ages 4+) ... 22.
KidsTime (educational, ages 3-8) ... 26.
American Discovery (U.S. facts & fun) ... 39.
Crystal Paint (graphic symmetries) ... 42.
ConcertWare+ (music composition) ... 39.
ConcertWare+ MIDI ... 79.

Greene, Inc. ... NCP

QuickDEX (address book) ... 32.

Hayden Software ... CP

Score Improvement for the SAT ... 58.

Hayes ... NCP

Smartcom II (communications) ... 88.

Ideaform ... NCP

MacLabeler or DiskQuick ... 27.
HyperBook Maker (print stacks into book) ... 42.

Imagine ... NCP

Smart Alarms (DA reminder system) ... 35.
Multi-user Appointment Diary ... 89.

Infosphere ... CP

LaserServe (network software) ... 62.
ComServe (NCP, modem sharer) ... 124.
MacServe (network software) ... 159.

Innovative Data Design ... NCP

MacDraft 1.2A (requires 512k) ... 149.

Intuit ... NCP

Quicken (personal accounting) ... 35.

Kent Marsh Ltd.

The NightWatch (hard disk security) ... 99.
MacSafe (advanced security program) ... 99.

LaserWare ... CP

LaserWorks (graphics editor, LaserWriter) ... 189.
LaserPaint (requires Mac Plus) ... 314.
LaserPaint Color II (256 gray scales; NCP) ... 379.

Layered ... CP

Notes for...Excel or Microsoft Works ... 40.
Notes for...PageMaker or Ready,Set,Go!3 ... 40.
Notes for...Microsoft Word ... 40.

Learning Company ... CP

Reader Rabbit (ages 7-12) ... 39.

Legisoft/Nolo Press ... NCP

WillMaker 2.0 (prepare your own will) ... 29.

Letraset ... NCP

Image Studio (image processing software) ... 279.
Ready,Set,Go! 4.0 (page layout) ... 279.

Linguist's Software ... NCP

Tech (1000 different symbols) ... \$59.
LaserTech ... 79.

FOREIGN LANGUAGE FONTS

SuperFrench/German/Spanish ... 39.
MacKana/Basic Kanji ... 39.

MacHebrew or MacKanji ... 59.

MacHindi Sanskrit (Amjer) ... 59.

MacSemitic/Coptic/Devanagari, MacKorean,

MacThai, MacGreek, MacHieroglyphics,

MacArmenian, MacGeorgian, MacCyrillic,

MacArabic/Farsi, MacAkkadian ... each 59.

MacHebrew Scriptures ... 79.

MacGreek New or Old Testament ... 79.

MacChinese (supplements available) ... 79.

MacGreek/Hebrew/Phonetics ... 89.

FOREIGN LANGUAGE LASER FONTS

LaserFrench/German/Spanish ... 79.

LaserGreek or LaserHebrew ... 79.

LaserTransliterator ... 79.

LaserKorean ... 89.

LaserCyrillic ... 115.

Living Videotext ... NCP

More 1.1C (outlines, windows, & tree charts) 175.

Lundeen & Associates ... NCP

WorksPlus Spell (spell checker for Works) ... 46.

WorksPlus Command (macros for Works) ... 61.

MacroMind ... NCP

VideoWorks II (animation tool) ... 118.

MacroPac International ... NCP

101 Macros for Excel ... 44.

Micro Analyst ... NCP

Mac Zap (recover crashed hard disks) ... 39.

MECA ... NCP

Managing Your Money (finance) ... 129.

Microlytics ... NCP

Word Finder (synonym finder) ... 37.

Microseeds Publishing ... NCP

Redux (fast & easy backup utility) ... 65.

Microsoft ... NCP

Basic Interpreter 3.0 ... 62.

Chart 1.02 (42 chart styles, CP) ... 79.

Microsoft Write 1.0 (w/spell checker) ... 113.

Multiplan 1.1 or File 1.05 ... 119.

Basic Compiler 1.0 ... 125.

Fortran 2.2 (compiler) ... 189.

Works 1.1 (integrated tool) ... 189.

Microsoft Mail (up to four users) ... 195.

Microsoft Mail (up to 10 users) ... 325.

Microsoft Mail (up to 20 users) ... 499.

Excel 1.06 (power spreadsheet) ... 249.

Word 3.02 (powerful word processor) ... 249.

PowerPoint (presentations) ... 249.

Migent ... NCP

In House Accountant (small business) ... 119.

Miles Computing ... NCP

Orchestra of Fonts Vol. 4 ... special 19.

Mac the Ripper Vol. 3 (req. Paint program) ... 27.

Peoples, Places & Things Vol. 5 ... 27.

Mindscape ... NCP

The Perfect Score: SAT (CP) ... 46.

ComicWorks (create your own comics) ... 47.

GraphicWorks 1.1 (newsletters & posters) ... 85.

Monogram ... NCP

Forecast (tax planning) ... 40.

Dollars & Sense (home, small business) ... 81.

Business Sense (full-featured) ... 282.

Nantucket ... NCP

McMax (dBASE III compatible) ... 179.

Nashoba Systems ... NCP

FileMaker Plus (feature-packed database) ... 149.

North Edge Software ... NCP

Timeslips III (time & expense tracking) ... \$119.

Odesta ... NCP

Double Helix II (relational, custom menus) ... 339.

Olduvai Software ... NCP

DA-Switcher (unlimited desk accessories) ... 25.

Post ART (clip art, 3 disk set) ... 35.

Icon-It! (create custom icon bars) ... 39.

FontShare (share PostScript® fonts) ... 159.

Read-It! ITS (OCR software for Thunderscan) ... 79.

Read-It! (300 dpi OCR software) ... 199.

OWL International ... NCP

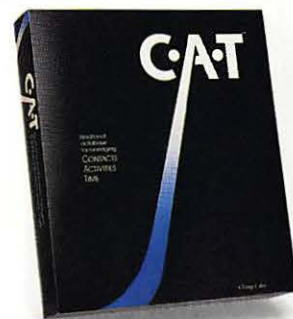
Guide 2.0 (hypertext, free-form info) ... 119.

Guide Envelope System ... 99.

Palantir ... NCP

MacType (typing instruction, NCP) ... 31.

inTalk (communication to emulation, NCP) ... 119.



Chang Labs ... 5 years

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Passport Designs ... CP

Mastertracks Pro (music editor) ... 259.

PBI Software ... NCP

HFS Locator Plus (DA organizer for HFS) ... 26.

Personal Computer Peripherals ... NCP

HFS Backup ... 28.

ProVUE Development ... NCP

OverVUE 2.1 (power-packed database) ... 149.

Rubicon Publishing ... CP

Dinner At Eight-Encore Edition Bundle ... 51.

Satori ... NCP

BulkMailer 3.0 (mailing lists) ... 79.

BulkMailer Plus (up to 90,000 names) ... 195.

Legal Billing (attorneys to accountants) ... 419.

Legal Billing II (full trust accounting) ... 549.

Project Billing (architects to engineers) ... 485.

Sensible Software ... NCP

Sensible Grammar ... 55.

Silicon Beach Software ... NCP

Silicon Press (printer utility, 512k) ... 41.

World Builder (program creator) ... 41.

SuperPaint (advanced graphics program) ... 79.

Simon & Schuster ... NCP

Typing Tutor IV (typing instruction) ... 35.

SoftStyle ... NCP

Epstart (Epson printer driver, CP) ... 27.

Laserstart (Hewlett-Packard Laserjet, CP) ... 58.

Printworks for the Mac (Dot Matrix) ... 43.

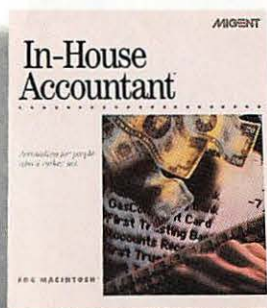
Printworks for the Mac (non-PostScript) ... 85.

SoftView ... NCP

MacInUse (time-use manager) ... 42.

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Suspect, & Witness 36.
Science Fiction Classics: Hitchhiker's,
Planetfall, & A Mind Forever Voyaging 36.
Zork Trilogy 42.
Invisicubes Hint Booklets (please specify) ... 6.
MacroMind ... NCP
Mazewars+ (play via modem or network) ... 31.
Microsoft ... CP
Flight Simulator (the Mac takes flight) 32.
Micro Sports ... NCP
MSFL Pro League Football 32.
Miles Computing ... CP
Down Hill Racer (3D ski simulation) 24.



Migent ... NCP
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Harrier Strike Mission II 27.
Fool's Errand (optional hint booklet avail.) 27.
Mindscape ... CP
Trust & Betrayal: The Legacy of Siboot,
Crossword Magic, Balance of Power, Deja Vu,
Shadowgate, Uninvited each 30.
Olduvai Software ... NCP
Maze Survival (action game) 21.
PBI Software ... CP
Strategic Conquest (multi-user) 35.
Primera Software ... CP
Smash Hit Racquetball II 22.
Psion ... CP
Psion Chess (3D and multi-lingual) 31.
Sierra On-Line ... CP
Leisure Suit Larry (swinging single life) ... 23.
King's Quest I, II or III. 30.

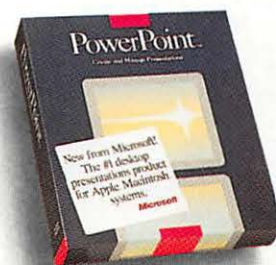
Space Quest (save the universe!) \$30.
Silicon Beach Software ... NCP
Airborne! (CP, digitized sounds) 20.
Enchanted Scepters (CP, over 200 scenes) 21.
Dark Castle (top-rated arcade action) 27.
Beyond Dark Castle (super sequel) 27.
Apache Strike (3D helicopter action) 27.
Simon & Schuster ... CP
Star Trek—The Kobayashi Adventure 24.
Sir-Tech ... CP
Mac Wizardry (high-rated fantasy) 35.
SPHERE, Inc. ... NCP
Tellstar II (No. & So. hemispheres) 15.
GATO (submarine simulator) 26.
Orbiter (space shuttle simulation) 26.
Falcon (F-16 flight simulation) 26.
XOR ... NCP
Pro Challenge (football) 32.
NFL Challenge (with illustrated handbook) ... 64.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

1 Meg SIMMs call for availability.
AST Research ... 6 months
Mac 286 (MS-DOS on your Mac II) call
AST TurboScan (300 dpi scanner) call
AST TurboScan (flatbed scanner) call
AST TurboLaser P/S call
Curtis Manufacturing ... lifetime
SURGE SUPPRESSORS
Safestrip (6 outlets) 21.
Diamond (6 outlets) 32.
Emerald (6 outlets; 6 ft cord) 36.
Sapphire (3 outlets; EMI/RFI filtered) 47.
Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) 59.
DataDesk ... 2 years
MAC-101 (high-performance keyboard) ... 139.
Dove Computer ... 90 days
Toolkit (clamp, torx driver & wrist strap) ... 15.
SCSI Interface/Port 85.
MacSnap 524E (512E to 1 Meg) 156.
MacSnap 524 (512k to 1 Meg) 175.
MacSnap 524S (512E to 1 Meg w/SCSI) ... 219.
MacSnap 548E (512E to 2 Meg) 389.
MacSnap 548 (512k to 2 Meg) 399.
MacSnap 548S (512E to 2 Meg w/SCSI) ... 449.
MacSnap 2S (1 Meg to 2.5 Meg) 489.
MacSnap 4S (1 Meg to 4 Meg) 969.
MacSnap 8S (for Mac II, to 8 Meg) 1939.
MacSnap Plus 2 (MacPlus to 2 Meg) 289.
MacSnap Plus 2H (MacPlus/SE to 2.5 Meg) 489.
MacSnap Plus 4H (Plus/SE/II to 4 Meg) ... 969.

68020 ACCELERATOR BOARDS FOR MAC SE
Model MSE 1 (16 MHz, 0 Meg of memory) \$585.
Model MSE 2 (MSE 1 with 1 Meg) 779.
Model MSE 3 (MSE 1 with math
co-processor) 779.
Model MSE 4 (MSE 1 with 1 Meg & math
co-processor) 975.
1024 Option (1 Meg accelerator or Mac II
memory expansion) 195.
Math Kit (math co-processor chip set) ... 225.
Ergotron ... 1 year
Mouse Cleaner 360° 15.
MacTilt or MacTilt SE 68.
MacTilt (for large monitor) 85.
Farallon Computing ... 1 year
PhoneNET-AppleTalk 120 9.
PhoneNET PLUS (DB-9 or DIN-8) 36.
PhoneNET StarController™ 1395.
PhoneNET Punch Down Block Wire Kit ... 69.
PhoneNET CheckNET™ (multi-user) 69.
TrafficWatch (monitor network) 159.
Hayes ... 2 years
Smartmodem 1200 299.
Smartmodem 2400 449.
MacPlus/SE/II 1200 or 2400 Package ... call
Kensington ... 1 year
Appletalk Cable Clips or Connectors ... each 1.
Mouseway (mouse pad) 8.
Mouse Pocket (for your idle mouse) 8.
Mouse Pocket (ADB) 8.
Mac Plus/Mac SE Cover 9.
ImageWriter II Dust Cover 9.
Printer Stand 16.
Mouse Cleaning Kit w/Mouse Pocket 17.



Microsoft ... NCP
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Tilt/Swivel	20.
Macintosh II Stand	21.
Universal Copy Stand	22.
Extra Long ADB Keyboard Cable	28.
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Macintosh II Monitor Cable	33.
Surge Suppressor	34.
Apple Security System	34.
Printer Muffler (80 column)	37.
Printer Muffler (132 column)	50.
Printer Muffler Stand (80 column)	25.
Master Piece 400 (replaces control center)	64.
A-B Box (mini DIN-8)	64.
System Saver Mac	64.
Turbo Mouse (specify MacPlus, SE or II)	82.

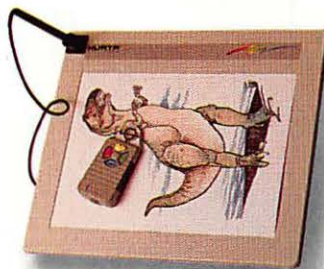
Koala Technologies ... 90 days	
MacVision 2.0 (digitizer)	225.
Kraft Systems ... 1 year	
3-Button QuickStick	39.
Kurta ... 90 days	
IS ADB Tablet (graphics tablet)	349.
Migent ... 1 year	
Pocket Modem (ext. 300/1200 baud)	168.
Mirror Technologies ... 1 year	
Magnum 800 External Drive (platinum)	199.
MSC Technologies ... lifetime	
A+ Mouse (optical mouse)	69.
A+ Mouse ADB (for Mac SE & II)	87.
Nutmeg Systems ... 90 days	
Nutmeg 15" Monitor (for MacPlus or SE)	1295.
Nutmeg 15" Monitor (for Mac II)	1395.
Nutmeg 19" Monitor (for MacPlus or SE)	1495.
Nutmeg 19" Monitor (for Mac II)	1595.
Nuvotech	
TurboNet/AppleTalk connector cable	6.
TurboNet (DIN8 or DB9 connector)	28.
Orange Micro ... 1 year	
Grappler (universal parallel interface)	64.
Passport Designs ... 90 days	
Passport MIDI Interface	95.
Personal Computer Peripherals ... 2 years	
HD-WSI (connects Apple HD 20 to SCSI)	295.
MacBottom HD 21 Meg SCSI	749.
MacBottom HD 21 Meg SCSI w/Modem	915.
MacBottom HD 32 Meg SCSI	899.
MacBottom HD 32 Meg SCSI w/Modem	1045.
MacBottom HD 45 Meg SCSI	1159.

MacBottom HD 45 Meg SCSI w/Modem	\$1295.
MacBottom HD 70 Meg SCSI	1395.
MacBottom IHD-144 Meg (for Mac II; 1 yr.)	2195.
Practical Peripherals ... 5 years	
1200 Baud External Modem	109.
2400 Baud Communications Pack	249.
SoftStyle ... 90 days	
MacEnhancer (for plotters to printers)	159.
Summagraphics ... 90 days	
MacTablet 12" x 12"	379.
Systems Control ... 2 years	
MacGard (surge protection)	55.
Thunderware ... 90 days	
ThunderScan 4.0 with PowerPort	199.
Mac II Power Accessory	42.

DISKS

Double-sided diskettes.

Sony 3 1/2" DS/DD Disks (box of 10)	18.
Fuji 3 1/2" DS/DD Disks (box of 10)	19.
Verbatim 3 1/2" DS/DD Disks (box of 10)	19.
MAXELL 3 1/2" DS/DD Disks (box of 10)	20.



Kurta Corp. ... 90 days
IS ADB Tablet—Finally, a graphics input system that's an ideal solution for the desktop publisher, CAD professional, and artist. Includes software, stylus pen & cordless mouse (with cross hairs)..... **\$349.**

INFORMATION SERVICES

CompuServe	
CompuServe Information Service	24.
Grolier's Online Encyclopedia	32.
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Dow Jones	
Dow Jones News/Retrieval Membership Kit	24.

ACCESSORIES

Clean Image Ribbon Co.	
Clean Image Ribbon Kit	12.
Computer Coverup	
External 800k Drive Cover	4.
ImageWriter II Cover	8.
Mac Plus or Mac SE Cover Set	10.
I/O Design	
ImageWare II (ImageWriter II carry case)	49.
Macinware SE (Mac SE carry case)	79.
Kalmar Designs	
Teakwood Roll-top Case (holds 45 disks)	14.
Teakwood Roll-top Case (holds 90 disks)	20.



Thunderware ... 90 days
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Teakwood Roll-top Case (holds 135 disks)	27.
Moustrak	
Moustrak Pad (standard 7" x 9")	8.
Moustrak Pad (large 9" x 11")	9.
Moustrak Pad L/F (9" x 10 3/4")	10.
Ribbons	
ImageWriter Ribbons	4.
Available colors: black, blue, brown, green, orange, purple, red, yellow and silver.	
Rainbow Pack (6 single color ribbons)	20.
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Sensible Softworks	
Quality "MacAttire" nylon dust covers	7-17.
High Trek ImageWriter II carry case	49.
High Trek Mac SE & ext. kybd. carry case	69.
Targus (Canada) Ltd.	
ImageWriter II Carry Case (black)	49.
MacPlus Carry Case (black)	59.

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Macintosh Communications Pack—Includes external 2400SA Modem, Microphone II communications software & cable. Hayes compatible, auto-answer. A superior value!..... **\$249.**

How Much Does a Mac Cost?

*Adding up the costs reveals
a lot about why the Mac sells for
what it does*

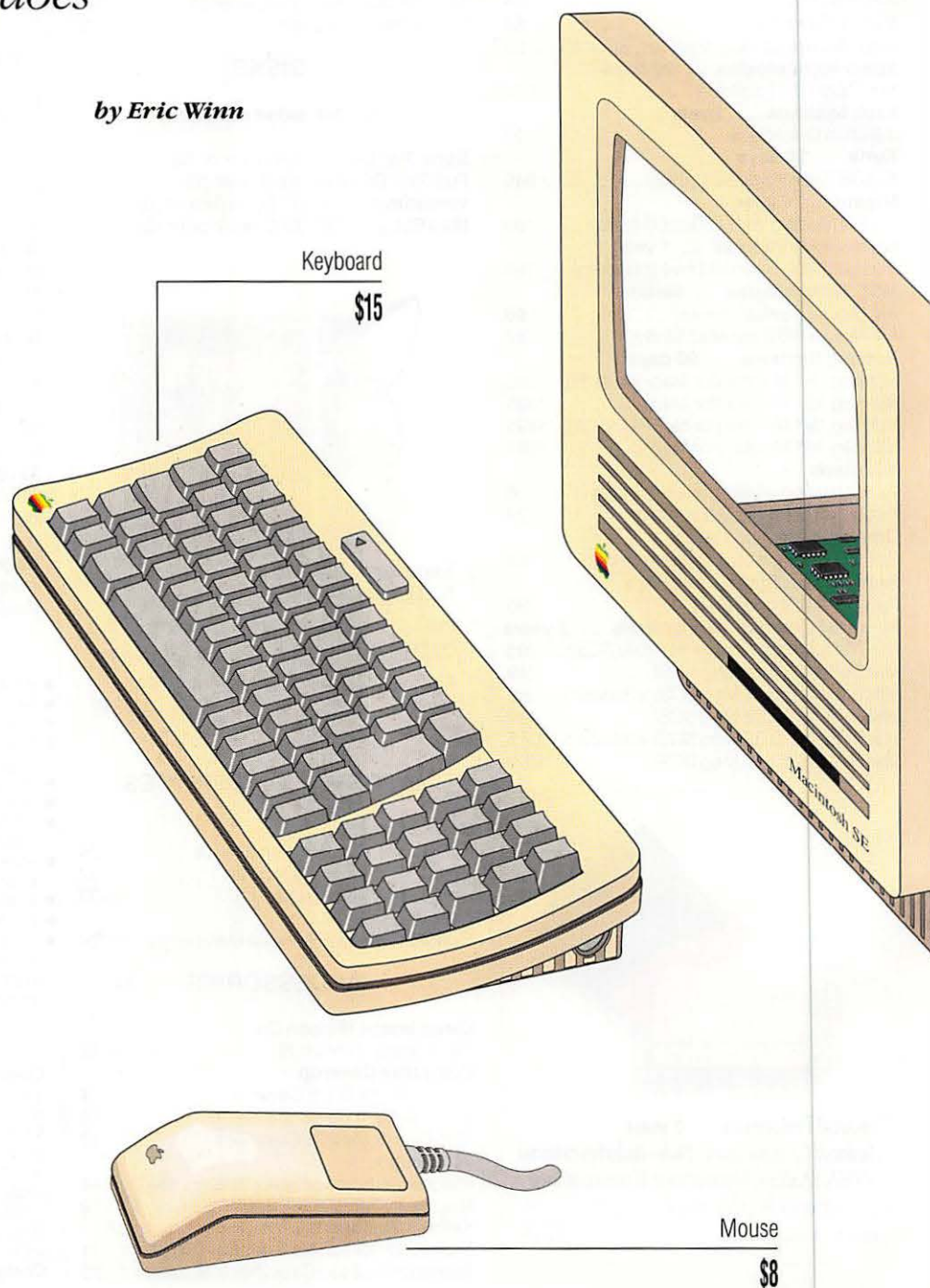
by Eric Winn

It's a question we've all pondered at some time or another: Where does our money go when we buy a Macintosh?

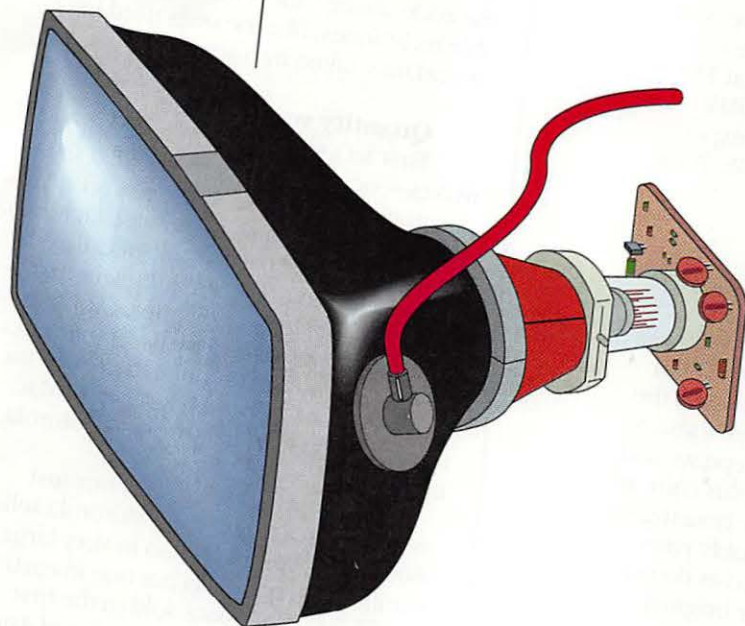
From taking apart a Mac SE with a 20-megabyte internal hard drive, it's clear that most of the individual components are easily available from electronics manufacturers and distributors. Of course, simply totaling the bill for the parts doesn't tell the whole story. The System software—the unique component that makes the Mac a Mac—isn't available from anyone but Apple. Unless Apple licenses the software to another party, or another manufacturer successfully produces a functional equivalent and manages to weather the inevitable litigation, the all-important ROM code will be available from one source only. And when you're the only game in town, the price of admission isn't negotiable.

The Exploded View

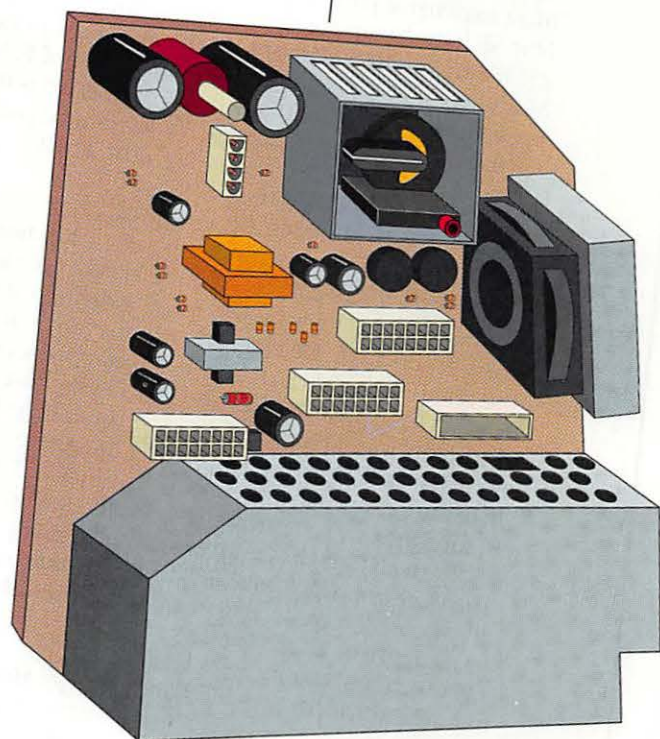
The Mac SE with the 20MB hard drive is Apple's best-selling model. For the purpose of this assesment the SE can be broken down into six separate modules, plus a category for miscellaneous items. These modules roughly correspond to those pictured in the exploded Mac illustration. In "Price Breakdown" I have estimated what Apple pays for each module.



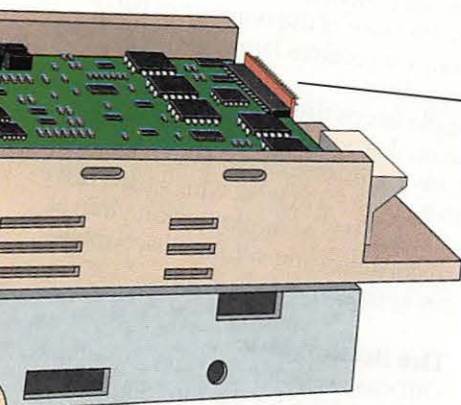
Display
\$15



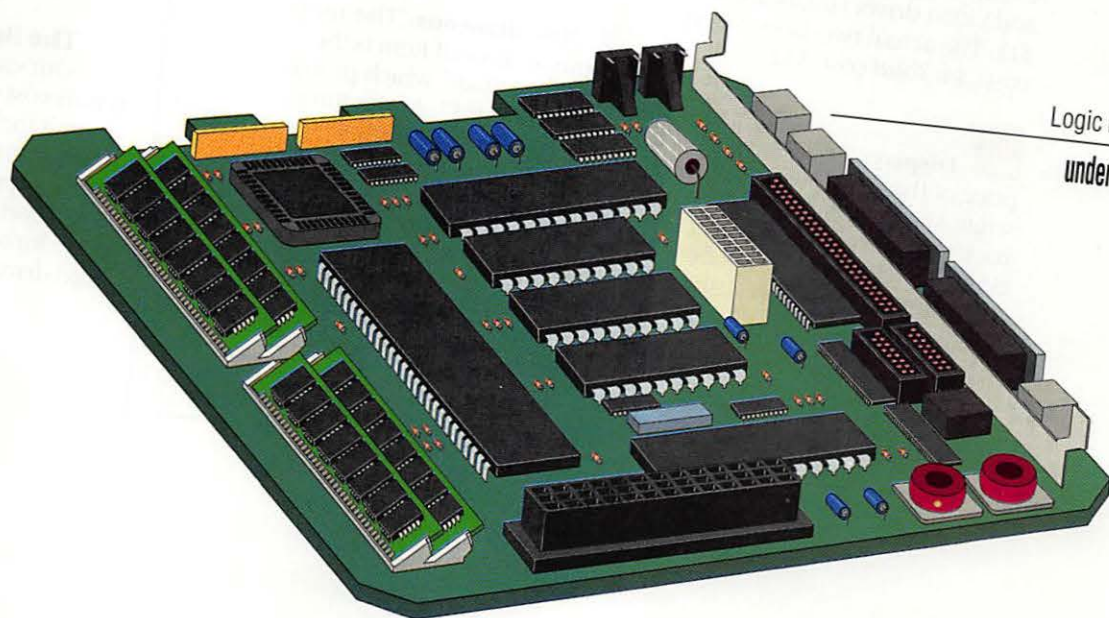
Analog Board
\$32



Disk Drives
\$300



Miscellaneous
\$18



Logic Board
under \$200

Price Breakdown



Logic Board: By far, the most expensive parts on the Mac SE logic board are the 256K Single Inline Memory Modules (SIMMs), which at press time averaged about \$30 each; at four SIMMs per Mac, that's \$120. With the current shortage of RAM chips, that price has been climbing. The SE's custom gate-array chip, which replaces 19 components on the Mac Plus logic board, costs around \$15. We estimate the combined cost of all connectors to total about \$10, and the actual four-layer logic board to cost \$15. The other hardware ranges in price from \$1 for the Sony sound chip to \$5 for the NCR SCSI controller. The very important Mac ROM chips cost \$3 apiece. Our biggest surprise? The 7.83 MHz 68000 chip probably costs less than \$6. *Total cost:* under \$200.



Analog Board: The prime expense in the analog board is the switching power supply, priced at \$15. Video circuitry (including the deflection circuits, high-voltage generator, and video driver) totals about \$13. The actual two-layer board costs \$4. *Total cost:* \$32.



Display: The estimated price of the 9-inch black-and-white Mac CRT is \$9. The fly-back transformer, which is a common television component, costs around \$4, and the cable harness runs \$2. *Total cost:* \$15.



Disk Drives: At least one 3½-inch floppy drive is included in every Mac. We estimated the price of one at \$50. At a cost of \$250, the 20MB hard drive is the most expensive single part of the SE. *Total cost:* \$300.



Keyboard: For the standard Apple keyboard, the key switches total about \$5. Inside the keyboard is an Intel 8021 microprocessor that scans the keys—cost, \$3. There's also a timer chip for key repeats, and the Apple Desktop Bus chip, at \$1 each. The plastic housing for the keyboard probably runs about \$5. (Plastic costs do not include tooling for original molds.) *Total cost:* \$15.



Mouse: The SE mouse uses optoelectronics to detect motion; for four channels of detection, the cost is about \$4. Of course, there's another Apple Desktop Bus chip, \$1, and a small microprocessor aboard, also about \$1. Plastic runs about \$2. *Total cost:* \$8.



Miscellaneous: The most obvious additional item is the Mac SE case itself, which probably costs about \$7. As the three cables run about \$1 each, that's another \$3. The lithium battery, which maintains Mac parameters, costs \$1. Finally, we'll add in \$4 for other items such as labels, knobs, and screws. By the way, that infamous Mac SE fan probably costs about \$3. *Total cost:* about \$18.

It's important to remember that these estimates do not include marketing and advertising, production, labor, or research and development costs. Apple's 1987 annual report shows that it spent \$191,554,000 on research and development alone last year. So the price of a single ROM chip, for example, doesn't reflect the time (and money) it took Apple engineers to develop the code inside. Nor is the value of patentable techniques, like the ones used in QuickDraw, taken into account.

Quantity versus Price

First let's take a look at how Apple makes—or puts together—an SE. I say puts together because Apple really only assembles the Mac at its automated factories. Apple buys many parts from specialized vendors, called original equipment manufacturers (OEMs). For example, Apple buys the 800K floppy disk drive assemblies from Sony. Apple buys chips, like the 68000 microprocessor that's the heart of the Mac, from the chip manufacturers—Motorola, in this case.

Of course, Apple doesn't buy just one 68000 at a time; when Motorola sells 68000s to Apple, it does so in very large quantities—enough to put one in each of the 175,000 or so Macs sold in the first quarter of 1988. The same is true of Apple's other OEMs and suppliers, such as those that provide disk drives, cables, and connectors. Because of the number of parts Apple buys, it receives large discounts from these suppliers.

Apple keeps the costs of these parts confidential. And so do the suppliers. As a result, my estimates of how much the materials that go into a Mac SE with a hard drive and a keyboard cost Apple—taking into account availability and volume discounts—are only approximate.

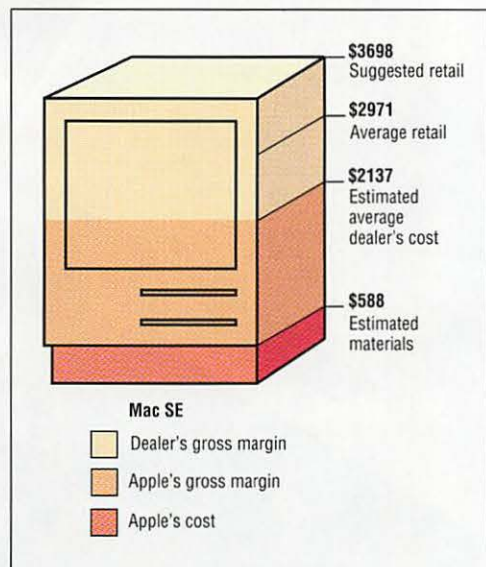
The Bottom Line

Our cash register rings up a total materials cost of \$588 for the Mac SE. This doesn't include packing materials (like boxes and that yellow diskette that comes in the floppy drive), documentation, or labor. Nevertheless, Apple's suggested retail price for a Mac SE with a 20MB internal hard drive and a keyboard is \$3698.

So there's a large disparity between Apple's cost and your cost—\$3110, to be exact. Where does that money go?

After assembly, Apple ships a Mac to an Apple dealer. Dealers, of course, must pay for that Mac. Apple breaks its dealer prices into tiers, as do almost all other vendors. (Commodore is a notable exception here.) In general, the more Macs a dealer buys, the less the dealer pays for each one. Other factors include incentive programs, the time of year, and whether the store is independent or part of a national chain.

According to sources, a volume Apple dealer in a major city pays Apple around \$2137 for a Mac SE equipped with a 20MB hard drive and a keyboard. That's about 3.6 times Apple's materials cost for the same computer. Again, this is a rough estimate. In comparison, qualified developers who design hardware or software for the Mac pay \$1874 for the same SE, while a student enrolled at a university belonging to the Apple University Consortium pays \$2305.



How Costs Stack Up

Although the SE lists for \$3698, a spot check of dealers across the U.S. indicated an average retail price of \$2971. The dealer's profit margin is, on the average, 28 percent. Apple's gross profit margin based on estimated parts costs is closer to 70 percent.

There's a difference of \$1561 between the estimated dealer cost of an SE and the suggested retail price. This figure represents the dealer's profit margin from Apple.

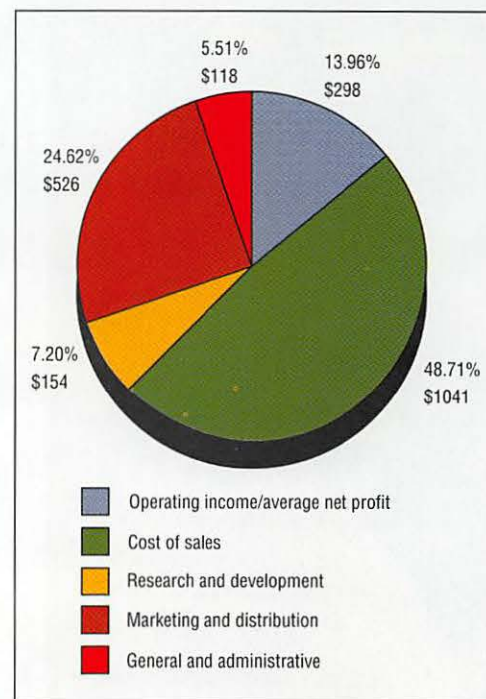
However, dealers very rarely sell the Mac SE at the suggested retail price. A spot check of Mac SE prices (including hard drive and keyboard) at about 30 Apple dealerships across the country—excluding mail order companies—turned up prices that ranged from a low of \$2865 to a high of \$3150. The average price was \$2971.

Now the difference between what you pay, on an average, and what the dealer pays, on an average, is \$834. That average 28 percent profit margin goes directly to the dealer. The dealer, and the dealer alone, sets this profit figure. The figure takes into account expenses—everything from storefront rent to salaries and commissions for the sales and support staff. Mail-order companies, on the other hand, can charge lower prices because they don't usually provide support, nor do they usually operate from a high-rent storefront.

Subtracting the estimated parts cost from the average dealer cost reveals that Apple makes about \$1549 on each Mac SE sold to a dealer. This 72 percent gross profit margin for the SE contrasts with the margin of 51 percent reported in Apple's 1987 annual report, a figure that reflects manufacturing and labor expenses, as well as the cost of goods, for all of Apple's product line: the Apple II, Mac Plus, Mac SE, and Mac II, as well as the LaserWriter and ImageWriter printers.

Apple's annual report also gives you an idea of where the revenues go. In 1987 Apple's net sales were \$2,661,068,000. Of that, only about 14 percent was operating income. The rest went back into the company to pay for expenses: research and development on future products, marketing and distribution, and cost of sales (materials, testing, production and manufacturing equipment, labor, and so forth). Applying the same percentages to Apple's net sales for the SE results in an estimated net profit to Apple of about \$298 per machine.

Apple's gross profit margins rank unusually high compared to those in the MS-DOS-compatible personal computer market, where price competition among manufacturers has sent prices—and conse-



The SE Divided

The breakdown in percentages for revenues from all products manufactured by Apple were taken from Apple's 1987 annual report. Applying those percentages to the average price a dealer pays for an SE results in a rough estimate of where SE revenues go at Apple. These figures show that Apple Computer makes roughly \$298 for every SE sold.

quently margins—spiraling downward. In a keynote address at the Macworld Expo '88 in San Francisco, Jean-Louis Gassée, Apple's senior vice president of research and development, declared that Apple's reluctance to lower its profit margins is based on a desire to evolve the Macintosh standard through its own research and design. The bottom line: don't expect to see a significantly lower-priced Mac from Apple in the near future. □

Eric Winn is a Silicon Valley marketing consultant with an interest in the economics of affordable systems.



Laser

er Writer II

Looking at Lasers

How to pick a winner in the crowded field of laser printers

by Jim Heid

The Macintosh laser printer market is as crowded as a field of presidential candidates in an election year. Last year, only a few printers dared challenge the incumbents, Apple's LaserWriter and LaserWriter Plus (see "Laser Wars," *Macworld*, June 1987). Today, the popular demand for near-typeset-quality copy has encouraged over a dozen printer manufacturers to throw their hats into the ring.

And now there's a two-party system. Buying a laser printer for a Mac used to mean buying one based on Adobe Systems' PostScript, the same page-description language LaserWriters use. As an alternative, you can now purchase a printer based on QuickDraw, the Mac's internal library of graphics commands. PostScript promises typographic prosperity and the peace of mind that comes with buying into the front-running page-description language. QuickDraw promises faster performance and is less taxing on your budget. What's more, you can change your vote later, for a price. Both of the currently available QuickDraw printers offer an upgrade path to a PostScript printer.

With laser printers costing between \$1900 and \$25,000, a printer may finish third behind a house and a car as the most expensive purchase you'll ever make. (If you drive what I drive, it ranks even high-

er.) You wouldn't buy a house or car based on one quick tour or test drive; apply the same informed approach to purchasing a printer. Use the information here to narrow the field of contenders to those that warrant a closer look. "Lasers on the Table" shows the specifications of Mac-compatible laser printers. "The Fully Powered Printer" describes some hardware accessories to boost performance and improve paper handling.

First, Assess the Brain...

A laser printer's *controller* is the circuitry that controls the printer's print mechanism, or *engine*. The design of the controller determines the printer's speed, its text and graphics capabilities, and its networking features. Thus, your first and most important choice is between a PostScript and a QuickDraw controller. In PostScript printers, the Mac translates its internal QuickDraw commands—which describe the appearance and position of everything on the page—into a special PostScript shorthand, and then transmits that shorthand over an AppleTalk cable to the printer. Any printer that uses a PostScript controller is compatible with Apple's LaserWriter; LaserWriter Plus; and the new PostScript-based LaserWriter IIs, the NT and NTX. (For PostScript basics, see "Getting Started with PostScript," *Macworld*, December 1987.)

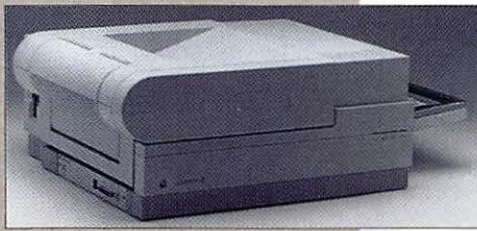
The QuickDraw-to-PostScript translation process isn't needed for QuickDraw printers such as General Computer's Personal LaserPrinter (PLP) and Apple's LaserWriter IISC (SC). That's one reason why

QuickDraw printers generally process pages with complex graphics more quickly than PostScript printers do. Another reason is that QuickDraw printers attach to the Mac's SCSI port, which transfers data faster than AppleTalk.

But speed isn't everything. What QuickDraw printers may occasionally gain in performance, they lose in capabilities. QuickDraw lacks PostScript's typographic sophistication, and neither the PLP nor the SC currently support all the typographic effects a PostScript printer can produce (see "PostScript Effects"). Attempt to print a page that includes special effects, such as spiral text, and you'll get either a low-resolution (72-dots-per-inch) approximation, or nothing at all. Moreover, fewer fonts are available for QuickDraw printers than for PostScript printers, and QuickDraw printers can't accept the output of PostScript-specific applications such as Adobe Illustrator.

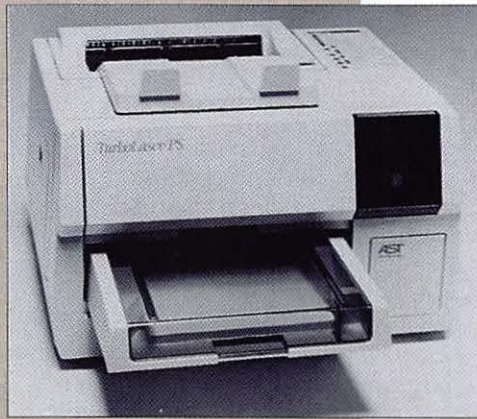
The gap between the capabilities of QuickDraw and PostScript printers may narrow. Using special QuickDraw commands called picComments, application developers can create programs that allow QuickDraw printers to replicate many of the effects that PostScript printers produce. (Aldus's PageMaker version 3.0 is one such application.) And as General Computer, Apple, and independent developers create more fonts for QuickDraw printers, PostScript's lead in font selection will shrink. Still, the bottom line will re-

Contributing Editor Jim Heid is a former typographer; his latest books include dBASE Mac in Business (Ashton-Tate Publishing, 1987) and Power Windows (Microsoft Press, 1988).



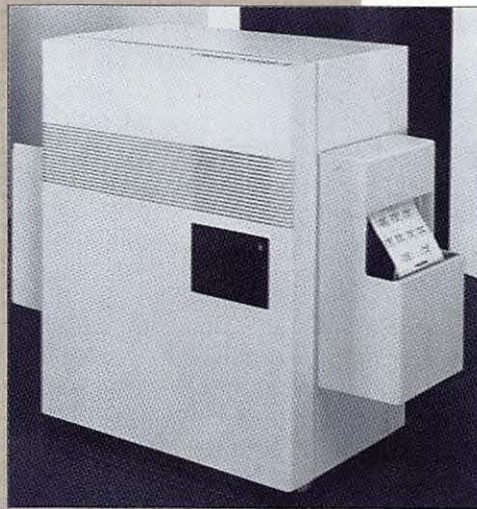
Apple LaserWriter II

Actually three printers. The SC has few fonts but it is faster than the GCC PLP. The NT is slower than the QMS-PS 810 and lacks HP emulation and a parallel port, but it costs less. The high-performance NTX provides a lot for the money, with optional hard disk and RAM expansion that's ideal for font lovers and demanding networks.



AST Research TurboLaser/PS

Three megabytes of RAM, ideal for downloadable-font bounds, but write-white images may be too dark.



Compugraphic CG400-PS

A \$29,995, Agfa-built, 400-dpi printer that sparked interest until being upstaged by Varityper's 600-dpi VT600.

main the same: for maximum typographic versatility and compatibility with software that produces special effects, you need a PostScript printer.

Unlike PostScript printers, QuickDraw printers are fussy about the company they keep. Because they're linked to the Mac's graphics routines, they don't work with computers such as IBM PCs. And because they attach to the Mac's SCSI port, they can't be shared by multiple machines on a network. (You can share the PLP on a network by adding General Computer's PLP Share—a \$499 hardware add-on. At this writing, there is no comparable device for the LaserWriter IISC.)

So why even consider QuickDraw printers? Besides offering occasional speed advantages over PostScript printers, they cost less. The suggested retail price for the PLP is \$1999, and it often sells for even less. There's no cheaper way to approximate that typeset look. And if someday you need PostScript's capabilities, you can upgrade to General Computer's Business LaserPrinter for another \$2999. At \$2799, the LaserWriter IISC costs more than the PLP but less than the PostScript-based LaserWriter IINT or IINTX (\$4599 and \$6599, respectively).

But the differences between the PLP and the SC don't end at the price tag. Each printer takes a different approach to using fonts and processing documents. Each approach has advantages and disadvantages. Outline fonts allow the PLP to provide the same nearly limitless range of sizes as a PostScript printer. But the time required for the Mac to translate font outlines into specific sizes makes the printer slower than an SC. The SC's ability to shoot an existing font over the SCSI cable makes it much faster—but typographically more limited—than the PLP.

The SC was designed for someone who doesn't need to print typographically complex documents—someone who might be completely happy with an ImageWriter if it printed 300 dots per inch (dpi) at eight pages per minute. The PLP, on the other hand, was designed as a low-cost alternative to a PostScript printer—it's a printer for the person who wants the typographic flexibility that outline fonts provide, but who is willing to trade some hard disk space and some time in order to save money.

PostScript Considerations

If you opt for a PostScript printer, you have several additional factors to consider. While all PostScript printers are compatible with the Mac, not all PostScript printers are created equal. Issues to consider include memory capacity, expansion options, the number of built-in fonts the printer contains, and if you plan to use it with computers other than the Mac, the interfaces and emulation modes the printer provides.

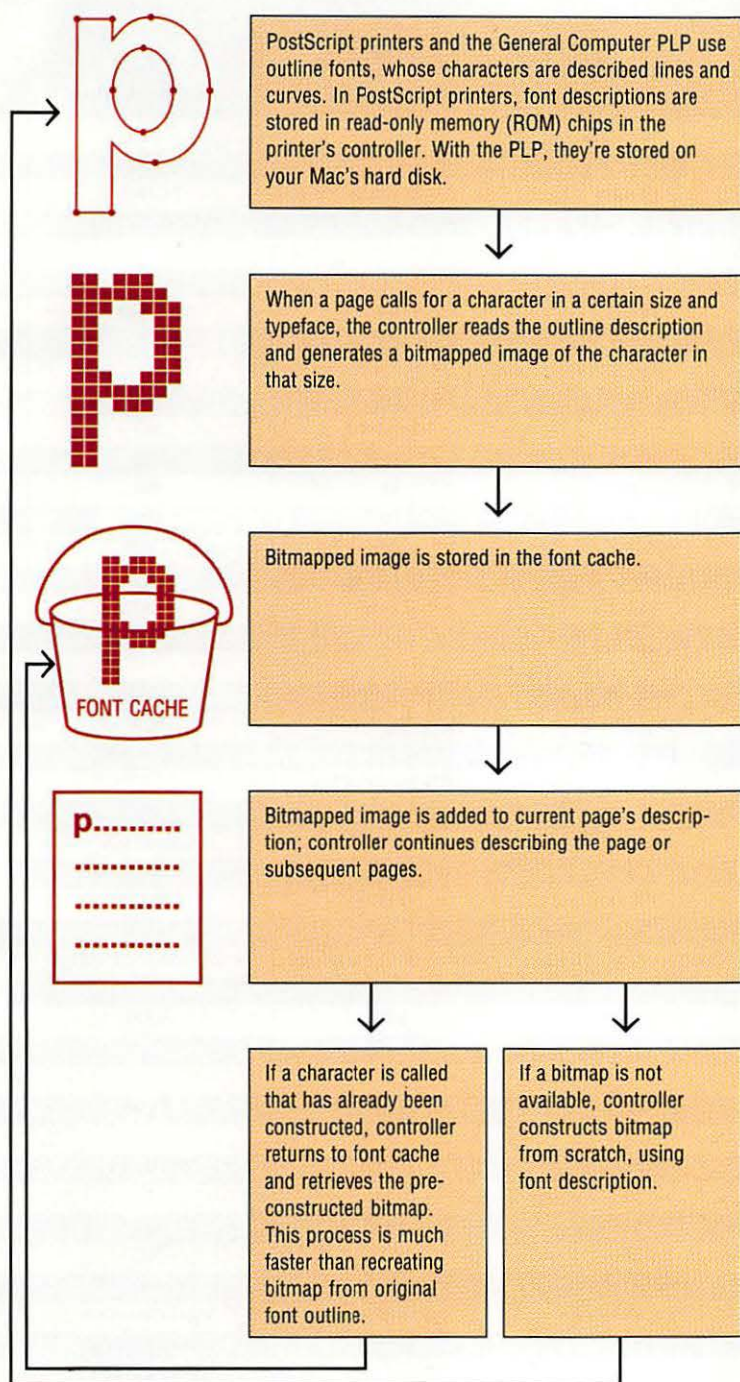
■ **Memory** Generally, the more random-access memory (RAM) a PostScript printer contains, the better. The amount of RAM in a PostScript printer influences the printer's performance and determines its capacity for *downloadable fonts*—fonts stored on disk and downloaded to the printer's memory before use. The amount of read-only memory (ROM) doesn't influence performance; ROM simply holds the printer's built-in fonts as well as the PostScript interpreter itself.

Most of today's PostScript printers contain 2 or 3 megabytes of RAM, divided into three distinct areas: the *page buffer*, which holds the bitmapped image of the page being generated; *virtual memory* (VM), general work space that also holds downloadable fonts; and the *font cache*, which retains bitmaps of characters that have already been translated from their ROM-based outlines (see "Fonts in the Cache").

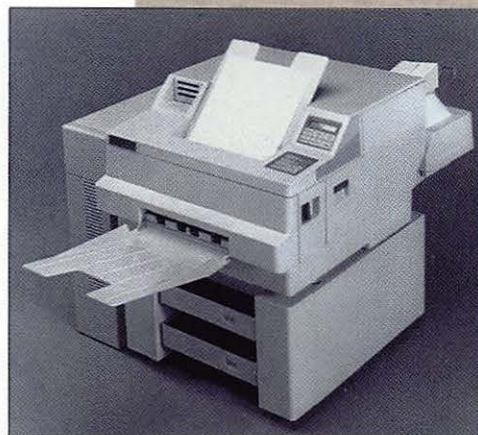
■ **Virtual memory** The more VM a PostScript printer provides, the more downloadable fonts it can hold. Most of today's PostScript printers use PostScript version 47, which uses memory more efficiently than earlier versions. The original LaserWriter, with version 23 of PostScript and only 1.5MB of RAM, offered less than 200K of VM, which limited you to roughly four downloadable fonts. Today, most PostScript printers contain at least 2MB of RAM and provide between 400K and 500K of VM, enabling them to hold approximately eight downloadable fonts (the exact number depends on the complexity of the fonts). In a printer with 3MB of RAM, the amount of VM increases to roughly 1MB. Expand Apple's LaserWriter IINTX to its maximum of 12MB of RAM, and you'll have room for enough downloadable fonts to print a type-specimen book.

■ **Font cache** The larger the controller's font cache, the faster the controller creates pages that contain numerous fonts and sizes. For example, I printed a ten-page newsletter, which included seven fonts in

Fonts in the Cache



The size of the font cache affects printer performance. This is especially true with typographically complex documents. The diagram shows how the font cache works and why a large font cache is desirable. Incidentally, in PostScript printers the size of the font cache doesn't change (although it differs from printer to printer). In the PLP the size of the font cache (which is created in the Mac's memory) can change, depending on memory available.



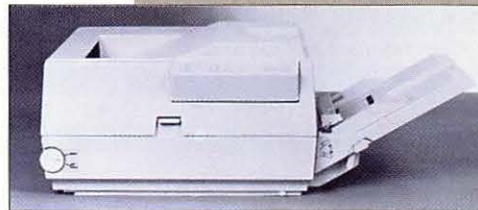
Dataproducts LZR-1260

Still in gestation, due on the market by the time you read this. If it lives up to specifications, it will give the LaserWriter IINTX a run.



Dataproducts LZR-2665

An 11-by-17-inch printer with promise. A new controller, now in development, should cure performance problems.



General Computer Laser Printers

The PLP is an inexpensive QuickDraw printer that uses outline fonts. But it can be slow. The Business LaserPrinter provides PostScript quality and good value, especially as an upgrade from the PLP.

several sizes, on both an Apple LaserWriter Plus, with a 160K font cache, and on a QMS-PS 800+ with a 279K font cache. The LaserWriter Plus took 22 minutes to print the document; the PS 800+ took only 9. When I printed a ten-page document consisting of only double-spaced Courier, the performance gap between the two printers narrowed to less than 2 minutes.

■ **Hard disk options** Apple's LaserWriter IINTX and Dataproducts' forthcoming LZR-1260 can turn an optional SCSI hard disk into an extension of the printer's VM and font cache. Varityper's VT600 includes a 20MB hard disk as standard equip-

Lasers on the Table

	Apple LaserWriter IISC	Apple LaserWriter IINT	Apple LaserWriter IINTX	Apple LaserWriter Plus
Controller Specifications				
Imaging language, version	QuickDraw	PostScript, 47	PostScript, 47	PostScript
Imaging location	System file	printer	printer	printer
Processor, speed	68000, 7.45 MHz	68000, 12 MHz	68020, 16.67 MHz	68000, 12 MHz
Font mechanism	bitmapped	outline	outline	outline
Font location	Macintosh	printer	printer	printer
Built-in fonts	0	35	35	35
Accepts font expansion boards/cartridges	no	no	yes	no
Hard disk for font storage	no	no	optional	no
Bitmap smoothing	yes	yes	yes	yes
Requires hard disk-equipped Mac	no, but recommended	no	no	no
Works with Mac 512K and 512KE	no	yes	yes	yes
Amount of RAM	1MB	2MB	2MB	2MB
RAM expansion upgrades	none	none	to 12MB	none
Other controller upgrades	to NT or NTX	to NTX	none	none
Size of font cache	n/a	200K	200K-1200K ²	160K
Interfaces ³	ADB, SCSI	A, ADB, R	A, ADB, R, SCSI	A, R
Emulation modes	none	Diablo 630	Diablo 630, HP LaserJet Plus	Diablo 630
Engine Specifications				
Print engine	Canon SX	Canon SX	Canon SX	Canon CX
Resolution (in dots per inch)	300	300	300	300
Rated engine life (in pages)	300,000	300,000	300,000	100,000
Writes white or black	black	black	black	black
Expendable components	drum-toner cartridge	drum-toner cartridge	drum-toner cartridge	drum-toner cartridge
Pages between replacement	4000	4000	4000	3000
Price for replacement	\$130	\$130	\$130	\$130
Maximum paper size (in inches)	8½ by 14	8½ by 14	8½ by 14	8½ by 14
Number of paper trays	1	1	1	1
Self-centering manual feed	yes	yes	yes	no
Capacity of paper tray (in sheets)	200	200	200	100
Optional paper accessories	envelope, A4, legal cassettes	envelope, A4, legal cassettes	envelope, A4, legal cassettes	A4, legal cassettes
List price	\$2799	\$4599	\$6599	discontinued (was \$5799)
Weight (in pounds)	45	45	45	75
Company phone	408/996-1010	408/996-1010	408/996-1010	408/996-1010

AST Research TurboLaser/PS	Compugraphic CG 400-PS	Dataproducts LZR-2665	Dataproducts LZR-1260 ¹	General Computer Personal LaserPrinter	General Computer Business LaserPrinter
PostScript, 47 printer	PostScript, 48.1 printer	PostScript, 46.2 printer	PostScript, 47 printer	QuickDraw Macintosh	PostScript, 47 printer
68000, 12 MHz	68020, 16.75 MHz	68000, 10 MHz	68020, 16.66 MHz	none (imaging occurs in Mac)	68000, 12.5 MHz
outline printer	outline printer	outline printer	outline printer	outline hard disk	outline printer
35	73	13	31	21 (stored on Mac hard disk)	35
no	no	no	no	no	no
no	yes	no	optional	no	no
no	no	no	no	yes	no
no	no	no	no	yes	no
yes	yes	yes	yes	no	yes
3MB	6MB	2.5MB	4MB	n/a	2MB
none	none	none	none	n/a	to 3MB
HP LaserJet Plus, HP plotter, Diablo 630 emulations	none	none	none	to Business LaserPrinter; PLP Share network interface	none
400K	16MB ⁴	200K	400K	varies (in Mac's RAM)	230K
A, P, R	A, P, R	A, P, R	A, P, R	SCSI	A, P, R
none	Diablo 630	Diablo 630	Diablo 630, LaserJet Plus	none	none
Ricoh 4081	Agfa	Toshiba A-740	Toshiba A-739	Ricoh 1060	Ricoh 1060
300	406	300	300	300	300
600,000	3.5 million	3 million	600,000	180,000	180,000
white	black	white	black	black	black
toner, belt cartridge	toner	toner, developer	toner, developer, drum	toner, drum, cleaning magazine	toner, drum, cleaning magazine
toner, 5000; belt, 10,000	6000	toner, 6000; developer, 40,000	toner, 5000; developer, 40,000; drum, 25,000	toner, 1500; drum, 20,000; cleaning magazine, 10,000	toner, 1500; drum, 20,000; cleaning magazine, 10,000
toner, \$96 (2 cartridges); belt, \$180	\$50	toner, \$25; developer, \$75	toner, \$25; developer, \$225; drum, \$295	toner, \$29; drum, \$110; cleaning magazine, \$89	toner, \$29; drum, \$110; cleaning magazine, \$89
8½ by 11	8½ by 14	11 by 17	8½ by 14	8½ by 14	8½ by 14
1	1, plus bin	2	3	1	1
no	yes	yes	yes	yes	yes
250	tray, 230; bin, 2000	250	250	150	150
none	legal cassette	500- and 1500-sheet feeders	envelope cassette, two-bin feeder	none	none
\$4595	\$29,995	\$17,900	\$7995	\$1999	\$3999
82	333	176	100	37	37
714/863-1333	617/658-5600	818/887-8000	818/887-8000	617/890-0880	617/890-0880

¹ Since the LZR-1260 was still in development at this writing (scheduled for delivery in June), these specifications may change.

² Font cache size in LaserWriter IINTX varies between 200K and 1200K, depending on amount of memory in printer.

³ A = AppleTalk; ADB = Apple Desktop Bus; P = Centronics parallel; R = RS-232C serial; SCSI = small computer systems interface.

⁴ Compugraphic CG 400-PS and Varityper VT600 use a portion of their internal hard disks for font caching.

⁵ PS Jet Plus is a replacement controller that adds PostScript to Canon CX-based printers.

Lasers on the Table

	NEC SilentWriter LC 890	QMS QMS-PS 800 II	Laser Connection QMS-PS 810	QMS QMS-PS 2400
Controller Specifications				
Imaging language, version	PostScript, 47	PostScript, 47	PostScript, 47	PostScript
Imaging location	printer	printer	printer	printer
Processor, speed	68000, 10 MHz	68000, 16 MHz	68000, 16 MHz	68000, 15 MHz
Font mechanism	outline	outline	outline	outline
Font location	printer	printer	printer	printer
Built-in fonts	35	35	35	13
Accepts font expansion boards/cartridges	no	no	no	no
Hard disk for font storage	no	no	no	no
Bitmap smoothing	no	no	no	no
Requires hard disk-equipped Mac	no	no	no	no
Works with Mac 512K and 512KE	yes	yes	yes	yes
Amount of RAM	3MB	2MB	2MB	2.5MB
RAM expansion upgrades	none	to 3MB	to 3MB	none
Other controller upgrades	none	none	none	none
Size of font cache	400K	279K	279K	279K
Interfaces ³	A, P, R	A, P, R	A, P, R	A, P, R
Emulation modes	Diablo 630, HP LaserJet Plus	Diablo 630, HP LaserJet Plus, HPGL plotter	Diablo 630, HP LaserJet Plus, HPGL plotter	Diablo 630
Engine Specifications				
Print engine	NEC 890	Canon CX-D	Canon SX	Xerox XP-24
Resolution (in dots per inch)	300	300	300	300
Rated engine life (in pages)	600,000	500,000	300,000	1.8 million
Writes white or black	black	black	black	black
Expendable components	toner, drum	drum-toner cartridge	drum-toner cartridge	toner
Pages between replacement	toner, 3000; drum, 7000	3000	4000	15,000
Price for replacement	toner, \$20; drum, \$110	\$130	\$130	\$74
Maximum paper size (in inches)	8½ by 14	8½ by 14	8½ by 14	11 by 17
Number of paper trays	2	2	1	2, plus bin
Self-centering manual feed	no	no	yes	no
Capacity of paper tray (in sheets)	each tray, 250	each tray, 250	200	each tray, 250; bin, 1500
Optional paper accessories	face-up output tray	A4, legal cassettes	envelope, A4, legal cassettes	A4, legal cassettes
List price	\$4795	\$6495	\$5495	\$24,995
Weight (in pounds)	68	99	45	325
Company phone	617/635-4400	800/631-2692, 205/633-4300	800/523-2696, 205/633-7223	800/631-2692, 205/633-4300

QUME ScriptTEN	Texas Instruments OmniLaser 2106	Texas Instruments OmniLaser 2108	Texas Instruments OmniLaser 2115	Laser Connection PS Jet Plus	Varityper VT-600
PostScript, 47 printer	PostScript, 47 printer	PostScript, 47 printer	PostScript, 47 printer	PostScript, 44 printer	PostScript, 48 printer
68000, 12 MHz	68000, 10 MHz	68000, 10 MHz	68000, 10 MHz	68000, 12 MHz	68020, 16 MHz
outline printer	outline printer	outline printer	outline printer	outline printer	outline printer
35	35	13	13	35	13
no	yes	yes	yes	no	no
no	no	no	no	no	yes
no	no	no	no	no	no
no	no	no	no	no	no
yes	yes	yes	yes	yes	yes
3MB	2MB	2MB	3MB	2MB	6MB
none	none	none	none	none	none
none	none	none	none	none	none
279K	286K	286K	312K	279K	10K ¹
A, P, R	A, P, R	A, P, R	A, P, R	A, R	A, P, R
HP LaserJet Plus	Diablo 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855	Diablo 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855	Diablo 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855	Diablo 630, HP LaserJet Plus	none
Hitachi	Ricoh 1060	Ricoh 4081	Ricoh 4150	n/a ⁵	undisclosed
300	300	300	300	n/a	600
300,000	180,000	600,000	1.5 million	n/a	360,000
white	black	white	white	n/a	black
toner cartridge, drum	toner, drum, cleaning magazine	toner, image belt	toner, image belt	n/a	toner, developer, drum
toner, 5000; drum, 30,000	toner, 1500; drum, 20,000; cleaning magazine, 10,000	toner, 6000; belt, 10,000	toner, 6000; belt, 20,000	n/a	toner, 2000; developer, 30,000; drum, 30,000
toner, \$160 (2 cartridges); drum, \$600	toner, \$29; drum, \$110; cleaning magazine, \$89	toner, \$79; belt, \$179	toner, \$79; belt, \$199	n/a	toner, \$108 (12,000 pages); developer, \$149; drum, \$785
8½ by 14	8½ by 14	8½ by 11	8½ by 14	n/a	8½ by 14
2	1	1	2	n/a	1
yes	yes	no	no	n/a	yes
250	150	250	250	n/a	200
sorter, 400-sheet feeder	250-sheet feeder	A4 cassette	A4, legal cassettes	n/a	A4, B4, legal cassettes
\$5595	\$4595	\$5995	\$7995	\$2995	\$13,500
90	37	77	88	n/a	161
408/942-4000	800/527-3500	800/527-3500	800/527-3500	800/523-2696, 205/633-7223	800/631-8134

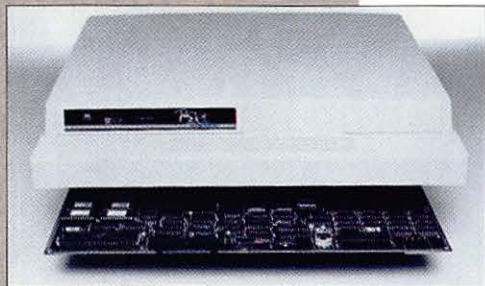
¹Since the LZR-1260 was still in development at this writing (scheduled for delivery in June), these specifications may change.

²Font cache size in LaserWriter IINTX varies between 200K and 1200K, depending on amount of memory in printer.

³A = AppleTalk; ADB = Apple Desktop Bus; P = Centronics parallel; R = RS-232C serial; SCSI = small computer systems interface.

⁴Compugraphic CG 400-PS and Varityper VT600 use a portion of their internal hard disks for font caching.

⁵PS Jet Plus is a replacement controller that adds PostScript to Canon CX-based printers.



The Laser Connection PS Jet Plus

A PostScript brain transplant for Canon CX printers such as HP LaserJets. A good idea for LaserJets with healthy engines.



NEC SilentWriter LC890

Technically not a laser printer, it uses light-emitting diodes to expose its images. A 400K font cache boosts speed.



QMS-PS 800 II

Yesterday's Canon CX engine, but with a fat paper tray and a fast (16 MHz) PostScript controller.

ment. In addition to acting as an extension to the printer's memory and font cache, a printer's hard disk can also hold downloadable fonts. Storing fonts on a printer's hard disk makes the fonts accessible to everyone on a network. In short, a hard disk-equipped PostScript printer is ideal for high-volume publishing applications involving multiple fonts and requiring maximum performance for typographically complex documents.

■ **Resident fonts** Most of today's printers include the same 35 fonts (nine font families) that are built in to the LaserWriter Plus, IINT, and IINTX. But a few printers still contain the original LaserWriter mix of only 13 resident fonts in four families—Courier, Times Roman, Helvetica, and Symbol. You can supplement those fonts with downloadable fonts at extra cost (see "Fit to Print," *Macworld*, April 1988).

■ **Bitmap smoothing** Only Apple's LaserWriters contain routines for smoothing the jagged edges of bitmapped images created by scanners and painting programs such as MacPaint (see "Smoothed versus Unsmoothed"). If you routinely print bitmapped images and prefer the smoothed look, you need an Apple LaserWriter.

■ **Emulation modes** In offices with both Macs and IBM PCs, you may be able to save money by sharing a printer. A printer's emulation modes allow it to mimic popular non-PostScript printers, such as the Diablo 630 or the Hewlett-Packard LaserJet series.

■ **Connection ports** All PostScript printers provide an AppleTalk port for attaching to Macs, and an RS-232C serial port for talking to other computers. Some also contain a Centronics parallel port, the most common printer port on IBM PCs and other MS-DOS computers. (You can also attach

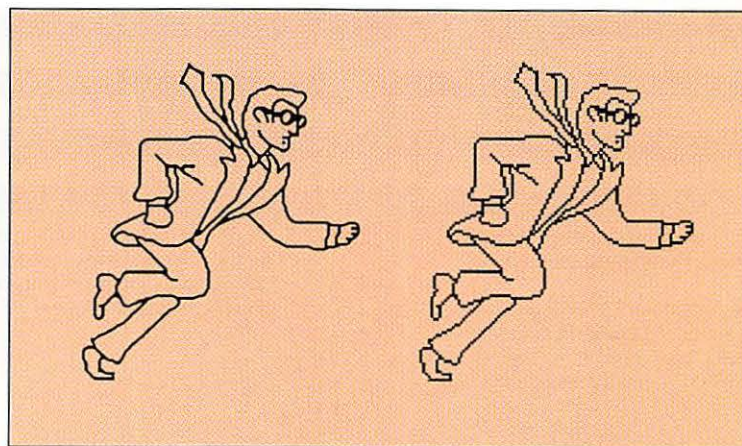
a PostScript printer to a PC by using an RS-232C cable or via AppleTalk by adding an AppleTalk expansion board to the PC. Apple, TOPS, and Tangent Technologies manufacture such boards.) Apple's LaserWriter IIs include an Apple Desktop Bus (ADB) port, which provides an additional means of attaching multibin paper feeders and other paper-handling add-ons. (Printers without ADB ports can still communicate with such accessories through the printer's RS-232C port.)

Next, Assess the Body...

A brain needs a body, and that's where a printer's engine comes in. The engine, the portion of the printer responsible for transferring an image to paper, determines resolution, print quality, and the number of pages you can print before an overhaul. For most PostScript printers, the engine has no bearing on speed. Because a PostScript controller must slog through many a calculation to create one page, manufacturers' page-per-minute ratings have been as realistic as EPA gas mileage ratings. Printers containing high-performance 68020-based PostScript controllers stand a better chance of printing at their engines' rated speed, but most 68000-based PostScript printers will do so only when churning out multiple copies of the same page.

Other engine-related considerations include:

■ **Print resolution** The more dots per inch a printer's engine produces, the sharper its output. All of today's under-\$10,000 printers offer 300-dpi resolution. Varityper's \$13,500 VT600 PostScript printer boasts 600-dpi resolution, a four-fold improvement over 300-dpi in dots per square inch (see Reviews, *Macworld*,



Smoothed versus Unsmoothed

Among PostScript printers, only Apple's contain smoothing routines that soften the jagged edges of bitmapped text and graphics. Among QuickDraw printers, both General Computer's Personal LaserPrinter and Apple's LaserWriter IISC provide smoothing.

Effect	General Computer PLP	Apple LaserWriter IISC
Rotation	yes	application dependent
Fountain	no	no
Bind	application dependent	no
Reverse	yes	yes
Shadow	no	no
Pattern	no	application dependent
Shear	yes	no
Stretch	yes	no

January 1988). When a 600-dpi image is commercially printed on newsprint or other low-quality paper, a phenomenon called *ink spread* smooths the image even more. That, combined with a lightning-fast 68020 and a hard disk-equipped PostScript controller, makes the VT600 ideal for newspaper graphics and typesetting applications.

■ **Print quality** The method a print engine's laser uses to inscribe images also influences print quality. In a *write-black* engine (used by Apple, QMS, and General Computer), the laser exposes areas of the

image that will appear black on the page, and the toner adheres to those areas. In a *write-white* engine (used by AST, Texas Instruments, and others), the laser exposes areas of the image that will appear white. The toner is then attracted to the unexposed areas.

Generally, write-white engines produce more-solid blacks and darker text, but they don't print fine lines and small text as cleanly as write-black engines do. Write-black engines handle delicate images bet-

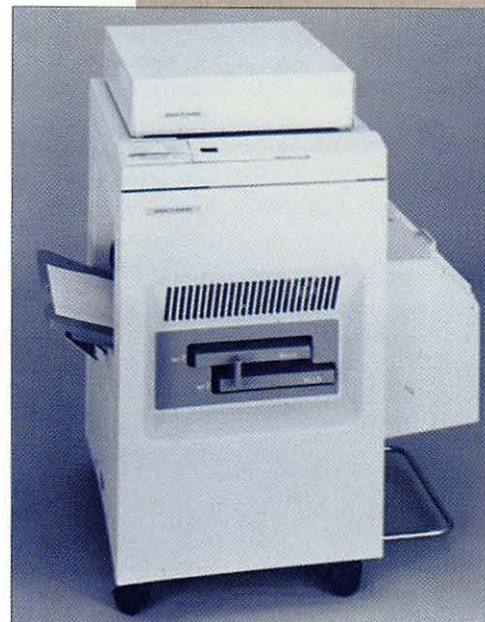
PostScript Effects

How do the printing capabilities of the QuickDraw-based General Computer Personal LaserPrinter and Apple LaserWriter IISC compare? Because it uses outline fonts, the PLP can duplicate more of PostScript's special effects than can the IISC. Documents containing effects unsupported by the printer may print at 72 dpi or may not print at all. The entry "application dependent" means that the printer's ability to reproduce the effect depends on the application software you use to create it. Newer applications, such as MacDraw II and PageMaker 3.0, support both QuickDraw printers better than do older applications.



QMS-PS 810

A sleek, Canon SX-based blazer: faster than a LaserWriter IISC, more emulation modes and a parallel port; also more costly.



QMS-PS 2400

An industrial-strength 11-by-17-incher with only 13 resident fonts. If you have the cash, it does the tabloids.



QUME ScriptTEN

A pretty pastel case, and the beauty goes deeper: 3MB of RAM, two paper cassettes, and emulation modes galore.



Texas Instruments OmniLaser Series

The 2108 (rear) and 2115 (right foreground) are fast and sturdy, making them suitable for network use. Their output from the Ricoh 4081 engine is too dark for small text and detailed line art but well suited to graphics with larger black regions. The 2106 (not shown) uses the Ricoh 1060 engine, which is suited to small text and detailed graphics but not heavy network use.



Varityper VT600

With a hard disk and 600 dpi, this sizzler is the next best thing to a typesetter—better, if you don't like working with photographic paper and chemicals.

ter, but large black areas may appear streaked. That problem was especially noticeable with Canon CX engines, such as those in Apple's original LaserWriters. Thanks to improvements in toner and cartridge design, Canon's new SX engine, used by LaserWriter IIs and the QMS-PS 810, produces much darker blacks. If you anticipate printing delicate images or 10-point and smaller text, you might prefer a write-black engine. Conversely, if you'll be printing pages that include large black areas (such as bar charts or white-on-black type), a write-white engine might be preferable. But see for yourself. Create a representative document and try printing it on both types of printer (at a copy shop or dealer).

■ **Engine life** If you plan to use your printer like a printing press, grinding out hundreds of copies, consider a unit with a high engine-life rating. Engine life ranges from 100,000 pages to over 1,800,000 pages.

■ **Paper size** Most laser printers have a maximum page size of 8½ by 11 inches. Many Mac applications can print larger pages on separate sheets that you assemble by hand. But for drafting, computer-aided design, and tabloid desktop publishing applications, you might prefer a printer with a larger maximum page size. Laser printers capable of producing 11-by-17-inch pages are available, but you'd better sit down before asking the price.

■ **Paper capacity** The more paper a printer holds, the less often you'll have to contend with out-of-paper messages. That's an important plus for large networks or other high-volume printing environments. Most printers' cassettes hold between 150 and 250 sheets, but many also accept optional feeders that hold up to 1500 sheets.

■ **Paper handling** Paper-handling features don't attract the same attention that font caches and special effects do, but they're more important when it comes to everyday use. After all, you're likely to spend more time shuttling paper cassettes in and out of the printer than you are printing stretched text in a spiral pattern. A printer that offers multiple paper trays lets you switch paper type or size without swapping trays. Assess a printer's approach to envelope printing, as well. Some offer optional envelope cassettes, while others

merely accept envelopes through the manual-feed slot—a less convenient alternative.

If you anticipate using manual feed often, get a printer with a self-centering manual feed slot. Such a slot consists of two adjustable paper guides; when you move one guide, the other moves accordingly. Self-centering manual feed slots make it easy to accurately position and feed envelopes and nonstandard paper sizes.

■ **Accessories** Most printers accept optional paper cassettes that allow the printer to automatically feed legal-size (8½-by-14-inch) paper—as well as envelopes, eliminating the need to hand-scrrawl an envelope for a letter that looks typeset. You can improve a single-cassette printer's paper-shuffling skills by adding a sheet feeder (see "The Fully Powered Printer").

Two final comments about print engines: you may hear talk of the cost-per-page advantages of Ricoh 4801 printing belts over Canon SX drum-and-toner cartridges. There are cost-per-page differences between engines, but they boil down to a negligible amount. Second, remember that laser printers are "nonim-pact" printers, so they can't print on multi-part forms or make carbon copies as an ImageWriter can.

Is It Time to Say Good Buy?

If you've been waiting to buy a laser printer, watching performance rise and prices fall, it might be time to collect your reward. Today's printers do more for less, and they do it faster and better. Apple's top-of-the-line LaserWriter IINTX now costs less than the original LaserWriter did.

The trouble is, the trend will continue. The next year is likely to bring a new generation of printers containing PostScript clones—compatible page-description languages—that are likely to cost less than true PostScript printers. But PostScript clones may not be 100 percent compatible with Adobe's PostScript. Incompatibility problems could range from poorer font quality (it's long been rumored that Adobe's controllers contain hidden routines that work with Adobe's fonts for better print quality) to incompatibility with PostScript-specific software. If you think making a buying decision is hard now, wait a while.

One way to balance future progress with your present needs is to buy a printer that offers upgrade options. Both Apple

The Fully Powered Printer

As laser printers proliferate, the number of hardware and software accessories grows, too. Software, such as downloadable fonts, can make a printer more versatile (see "Fit to Print," *Macworld*, April 1988). And add-ons, such as paper feeders, can make a printer more convenient to use.

For business applications, a multibin paper feeder greatly simplifies working with different types and sizes of paper (for more on sheet feeders, see *Reviews* in this issue). For example, with a LaserFeeder, you can automatically print the first page of a letter on your company letterhead, output subsequent pages on plain paper, and then print an envelope. For high-volume printing applications, a large-capacity paper tray keeps reams of paper on tap, meaning fewer out-of-paper messages and fewer interruptions.

A buffer is a hardware add-on that eliminates waiting time by immediately accepting print data from each Mac in a network and storing it in the buffer memory. The buffer then communicates with the printer while you work. Hardware buffers are far more expensive than their software equivalents, spoolers, but are more efficient, faster, and more reliable. (For more details on buffers and spoolers, see "Speaking of Spoolers," *Macworld*, June 1987, and "Getting Started with MultiTasking," in this issue.)

Paper Feeders

■ **MultiFeeder** five paper cassettes, one envelope cassette, for Canon CX engines; SX model scheduled for summer 1988. \$5095. BDT Products, 714/660-1386.

■ **LaserFeeder** two paper cassettes, one envelope cassette, for Canon CX engines; SX

model scheduled for summer 1988. \$1895. BDT Products, 714/660-1386.

■ **Paper Plus 500** 500-sheet feeder for Canon CX engines. \$995. The Laser Connection, 205/633-7223.

■ **Big Bin 1000** 1000-sheet feeder. Model SX for Canon SX engines, Model 4080 for Ricoh 4080 engines (includes AST TurboLaser); Model 4150 for Ricoh 4150 engines (includes Texas Instruments OmniLaser series). \$795. The Laser Connection, 205/633-7223.

Buffers

LaserServer—buffer for PostScript printers. With 2MB memory \$2295. DataSpace Corporation, 800/387-0492.

MacBuffer LW—buffer for PostScript printers. With 1MB memory \$1895; with 2MB \$2695. Ergotron, 800/328-9829.

and General Computer offer PostScript upgrades to their QuickDraw printers. In the end, choosing between a PostScript and a QuickDraw printer means balancing your printing requirements against your budget. If you have only one Mac and you print primarily simple text and non-PostScript graphics, you may find that a QuickDraw printer's lower price and faster performance outweigh its typographic limitations and unsociability. In that case, your choice is between the Personal LaserPrinter and the LaserWriter IISC. The PLP is more versatile than the SC, but its let-the-Mac-do-it approach to font handling makes it slower. (For more comparisons between the two printers, see "The LaserWriter

Lines Up," *Macworld*, March 1988; we'll also be reviewing the IISC in an upcoming issue of *Macworld*.)

If you already own a laser printer, is it time to turn it into a ship's anchor? No. Yesterday's printers may be slower and heavier than the new models, but their output still boasts the same number of dots per inch. Canon's new SX engine offers darker blacks and a longer life expectancy, but thousands of LaserWriters, LaserWriter Pluses, and other Canon CX printers are still churning out perfectly acceptable copy.

And don't forget that you can enter the world of Helvetica and Times Roman without actually making the Big Buy. Thousands of copy shops, computer stores, and

desktop publishing services rent time on laser printers and PostScript typesetters. Trotting downtown to run off a document isn't as convenient as printing in the comfort of your own home, but for many people, it works. And with the money you'll save, you could almost buy a new car to make the trip more comfortable.

But if you're all set to buy a laser printer, shop carefully. Because as many voters have found out, there's nothing worse than electing the wrong candidate and having to live with your choice for years. □

See *Where to Buy* for contact information.

Networking from a Distance

by Brita Meng

It's not easy being 3000 miles away from the home office, but as *Macworld's* East Coast Editor, that's how far I am from the rest of the staff. While the distance is vast (and being in different time zones makes the separation seem even greater), connecting to the AppleTalk network in San Francisco from my Boston-based Mac helps me work as if I were right in the home office. Using products that let my Mac operate as a remote AppleTalk node, I can send and receive E-mail, access documents on the file server, and even print reports on the remote LaserWriter.

Sound great? It is. I don't know what I'd do without my San Francisco connection. But while assembling our long-distance network, I ran into a few problems. Getting everything running was at times an exercise in forbearance.

When we first decided to install the remote node last summer, only one remote-access product was available, the Hayes InterBridge. Since then, several other products offering remote-node access have come on the market, and new ones have been announced (see "New Paths for Remote Networkers"). The products we've tested, in addition to the InterBridge, are Solana Electronics' R-Server and Shiva's NetSerial.

Hayes InterBridge

The Hayes InterBridge joins or *bridges* AppleTalk networks via a telephone line and a modem (see Figure 1a). It attaches to the network the way a Mac does, with a standard AppleTalk box. You attach the modem—Hayes recommends using at least a 2400-baud modem with the InterBridge—to a serial port on the back of the InterBridge. Since you can dial an InterBridge only with another InterBridge, each location must have its own modem and InterBridge.



While installing the InterBridge, I ran into difficulty. Because the InterBridge isn't really meant for connecting a single remote Mac to a network, I had to create a one-Mac AppleTalk network. That seemed like overkill for single-user access. It also threatened to bury my desk with AppleTalk cable.

We spent more than a day trying to get the InterBridge to work with two Novation Professional 2400-

baud modems. After a phone call to Hayes, I discovered that the company recommends using a Hayes modem with the InterBridge. We complied.

We also had to program the Hayes 2400-baud modems before connecting them to the respective InterBridges. That meant attaching the modem directly to the Mac and then running Red Ryder so that I could send a cryptic string of Hayes commands to the modem. I then had to disconnect the modem from my Mac and connect it to the InterBridge.

After several programming attempts and many telephone calls we finally got the InterBridge to work. During this period, I became proficient at cable-swapping and fluent in the Hayes AT command language. It must have been a quirk of fate that the first document I sent to the San Francisco LaserWriter was a typed list of AT commands.

Since installing the InterBridge, I have had no problem running Microsoft Mail 1.35 (formerly InterMail). Nor have I had any trouble with AppleShare 1.1. I

Hayes maintains that InterBridge Manager should not be a program you pop in and out of frequently; rather, it should be used once to set up the bridge and dial the remote number. Unfortunately, I don't think most users could afford to pay for an extended, 24-hours-a-day, five-days-a-week telephone call from Boston to San Francisco.

Performance at 2400 baud isn't blazingly fast—but it's not unbearably slow either. After all, a 2400-baud modem runs at about 1 percent the speed of LocalTalk. I investigated the possibility of getting the InterBridge to work with a 9600-baud modem, but that requires a new ROM (version 1.09). Until Hayes ships that ROM to me, it looks as if I'll stay at 2400 baud with the InterBridge.

Solana R-Server

The next product I evaluated was Solana's R-Server. The R-Server has one serial port for a modem and one AppleTalk port, but it lacks an on-off switch. Just



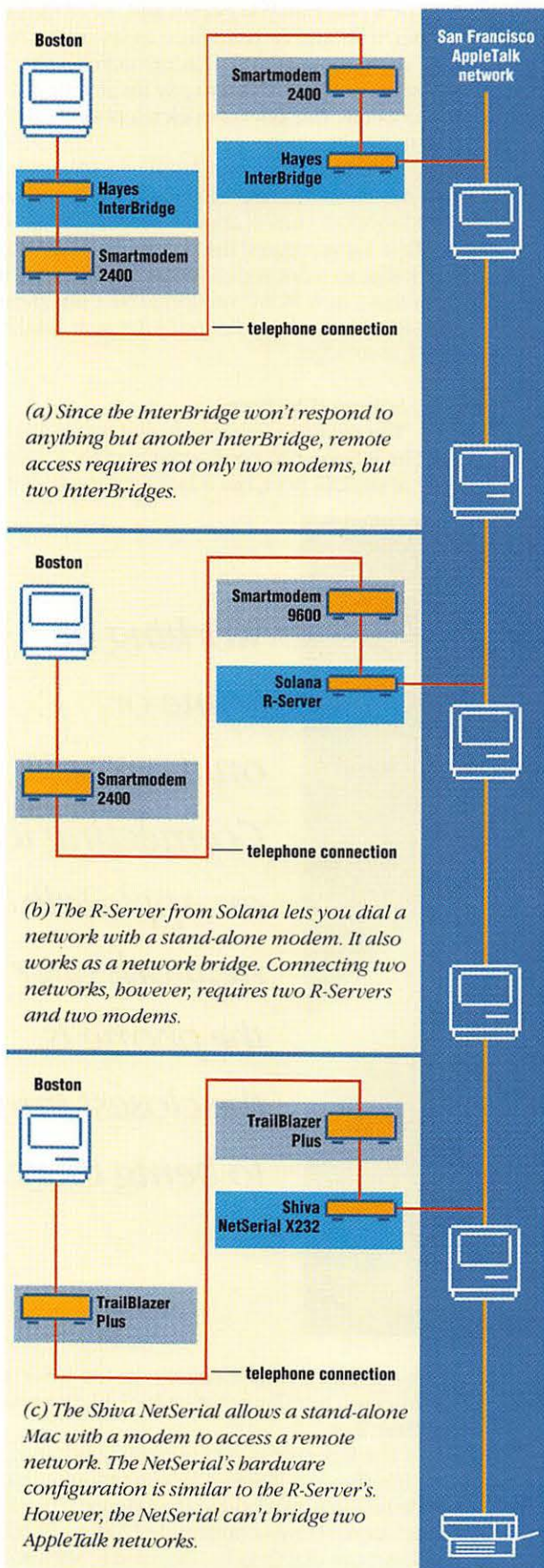
*Working at
home or
on the road?
Connecting with
an AppleTalk
network over
the phone is
the closest thing
to being there.*

do, however, continue to have problems with the program Hayes uses to automate the InterBridge dial-in procedure. InterBridge Manager is not compatible with MultiFinder (see Figure 2). This means that every time I want to connect to and disconnect from the network in San Francisco, I must restart the Mac under the Finder.

plug it in and it runs. Once it's on, the R-Server performs a self test that makes it look like something out of "Star Trek."

The R-Server is very appealing because, unlike the InterBridge, R-Server doesn't require that each node have its own bridge (see Figure 1b). Rather, any stand-alone, Hayes-compatible 1200- to 19,200-baud modem can dial in to it. I decided to stick with the

Figure 1



workhorse Hayes SmartModem 2400 when testing the R-Server. Since Solana claims that the R-Server automatically adjusts itself to the speed of the calling modem, I also tried running the R-Server with a Hayes V-Series Smartmodem 9600.

Setting up the answering modem—the one connected to the R-Server—proved to be difficult. Even after running the script that Solana provides to help configure Hayes modems, I still had to program the modem to answer the phone automatically. That was easy compared to assigning a network number and zone name to the R-Server, a procedure that requires shutting down all devices on the network except the R-Server and the Mac that runs the R-Server Manager.

The R-Server either bridges two AppleTalk networks or connects a remote Mac to an AppleTalk network. The setup procedures differ, depending on how you use the R-Server. In both cases you run Solana's R-Server Manager. Because of poorly organized documentation, I repeatedly found myself confusing the remote-node and remote-bridge setup procedures.

To call the R-Server from a remote Mac, I used Solana's Asynch AppleTalk desk accessory (see Figure 3). Asynch AppleTalk replaces the standard AppleTalk driver so that network information can be sent and received over a modem. However, because you must attach the modem to the Mac's printer port—also the AppleTalk port—you must disconnect the Mac from the local AppleTalk network, a definite drawback.

Until I figured out how to assign network numbers and zones, I tried several times, unsuccessfully, to connect the remote Mac with the R-Server. But I did finally connect it. Different modem speeds didn't fool it, and Microsoft Mail and AppleShare worked without any problems at 2400 baud.

I haven't yet tried bridging my AppleTalk network to the office network with the R-Server, but I have seen this work. If you're interested, Solana has an R-Server at its offices for guest dial-in access. Just ask the company for a demonstration disk.

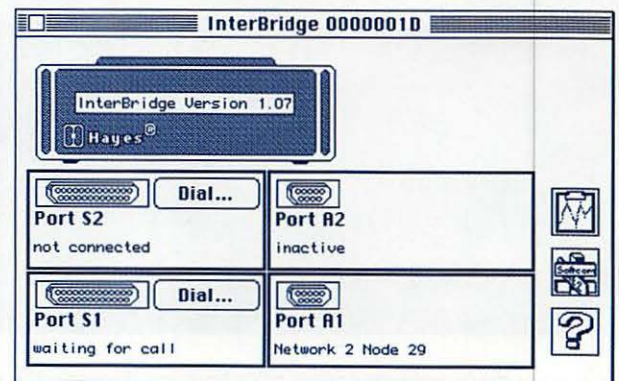


Figure 2

To dial the remote network, you run the InterBridge Manager and click on the Dial button. In this screen, port S1 connects to the modem and port A1 connects to the LocalTalk network. Double-clicking on a connector icon opens a dialog box that lets you configure that port.

New Paths for Remote Networkers

This year's Macworld Expo attendees saw that the number of products offering remote access has grown significantly since last year. Several new products were announced, in addition to new versions of currently available solutions. While we weren't able to test any of them before this article went to press, here are some alternatives to consider.

TeleNode from DataSpace is a hardware device that allows any remote Mac to connect to a local AppleTalk network over telephone lines or via a Northern Telecom SL-1 telephone switch. The only required equipment for the remote user is a modem, and dial-in software installs from the Network option in the Control Panel.

In addition to file-server and E-mail access, DataSpace is also working with WOS Data Systems to enable remote control of a Mac with the TeleNode and Timbuku. Expected availability is at the end of March, with a price of \$595.

A software-based bridge, Liaison from Infosphere, allows remote users or networks to dial into AppleTalk and EtherTalk networks. Liaison features a Network Management facility to provide password and network-access security; network

administrators can limit user access to services in one zone.

According to Infosphere president Evan Solley, Liaison can also bridge AppleTalk and EtherTalk networks. As a result, users on EtherTalk will be able to access a LaserWriter on AppleTalk without a hardware gateway like the Kinetics FastPath. Price for Liaison is \$195, with delivery in the first quarter of 1988.

LaCie demonstrated its software-based modem and disk server SilverServer. This product allows a user to mount remote hard disk volumes via modem. Local or remote hard disks appear as icons on the Mac screen, and SilverServer users can share each other's disks. All volumes, whether remote or local, can be password protected. Pricing for the program is \$99 for one stand-alone Mac, and \$199 for a networked server.

Tangent Technologies and Solana Electronics announced joint development plans for two remote-access products that will work with Solana's R-Server. MacRAT allows Mac laptop users to connect with AppleTalk networks; PCRAT enables MS-DOS laptop users to access AppleTalk networks.

The software should be fully

compatible with TOPS and AppleShare file servers. In addition, both will work with Tangent's TangentShare, which allows an IBM PC to act as an AppleTalk file server. Solana will sell MacRAT and PCRAT, and they will be available at the beginning of April.

Solana also announced a new version of software for its R-Server. Rather than using the Asynch AppleTalk desk accessory to dial a network, you use the Network option in the remote Mac's Control Panel. The new software also offers greater security. The R-Server will remain compatible with the old desk accessory.

For all of these remote-node products, we recommend that you call the vendor to verify delivery dates and prices. Ask about compatibility with your installed network services—file servers and E-mail systems. Another thing to check is modem compatibility. Although several high-speed modems, such as the TeleBit TrailBlazer, can use Hayes commands, the proprietary error-checking protocols used by such modems may not be compatible with the Asynchronous AppleTalk protocols.

Shiva NetSerial

I decided to really up the stakes in remote-node testing by using the 19,200-baud TeleBit TrailBlazer Plus modem with Shiva's NetSerial X232. The NetSerial has a serial port for the TrailBlazer and an AppleTalk port, which I used for the *Macworld* network. All my remote Mac needed was a stand-alone TrailBlazer to dial the San Francisco network (see Figure 1c).

Configuring the modems meant typing another series of cryptic commands into each TrailBlazer. I expected that. The surprise was that the NetSerial connection worked the first time.

Instead of an application or desk accessory to dial the network, Shiva uses the Network option called Dial-In Access in the Control Panel (see Figure 4). I installed it with an Installer script that Shiva provided.

Double-clicking on the Dial-In Access icon produces a connect screen. Using Shiva's TeleBit modem script, I easily configured a connect choice for the *Macworld* network. Because Dial-In Access gave me a choice between calling from the printer port or modem port, I didn't have to disconnect my AppleTalk ca-

ble. I was getting tired of cable swapping.

To dial the network, all I did was select its name and double-click. I had no trouble connecting the two TrailBlazers and no trouble running Microsoft Mail and AppleShare with the NetSerial.

There's a definite difference in speed with the TeleBit modems: AppleShare, in particular, works considerably faster. I transferred a 293K folder of sound files from the *Macworld* file server to my Mac in 9¼

minutes; it took my InterBridge with a 2400-baud modem about 25½ minutes to transfer the same folder.

The Price of Working at Home

Now for the crucial question: which of the three remote access products to buy? Because it requires an AppleTalk network (\$799 each) on both sides of a remote-node connection, the InterBridge is neither a cost-effective—nor a very portable—remote-node solution for a single user. I certainly don't have an AppleTalk network set up at home, and I have enough trouble lugging my Mac around without carrying a modem and an InterBridge too.

On the other hand, I've used the InterBridge for four months now, and it has proved to be reliable. It is also an excellent solution for connecting relatively large AppleTalk networks. With its two serial ports and two AppleTalk ports, the InterBridge can handle two remote bridges and one local bridge simultaneously.

At \$595, the R-Server is a better choice for one-person remote access than the InterBridge. You need only one bridge for the network, plus two modems. And the ability to connect to the network from a Multi-Finder-compatible desk accessory is a plus—the B-Server software was much less intrusive than InterBridge Manager. My only hope is that Solana will make its manual a little easier to understand.

At \$399, the NetSerial is an excellent choice for one-person remote-node access. Anybody familiar with the Control Panel will find Shiva's Dial-In Access very easy to use, and it doesn't make you physically disconnect AppleTalk or printer cables from the Mac. Unfortunately, the NetSerial can't function as a remote bridge. (The price difference between the NetSerial and the R-Server reflects this inability.) If you're looking to provide strictly one-person remote-node access



DAVID BISHOP

Products that let you work remotely include Shiva's NetSerial (top), Hayes's InterBridge, and Solana's R-Server. TeleBit's TrailBlazer Plus modem can speed up remote links considerably.

Remote Node Product Compatibility

Company	Product	TOPS	Apple-Share	MacServe	MS Mail	InBox	Laser-Writer	PBX	Remote User Access ¹
DataSpace	TeleNode ³	•	•	•	•	•	•	•	•
Hayes	InterBridge	•	•	•	•	n/a	•	•	
Infosphere	Liaison ³	•	•	•	•	•	•	n/a	•
LaCie Ltd.	SilverServer ³	•	•	n/a				•	•
Shiva	NetModem V1200	•	•	n/a	•	•	•	•	•
	NetModem V2400 ³	•	•	n/a	•	•	•	•	•
	NetSerial X232	•	•	n/a	•	•	•	•	•
Solana Electronics	R-Server	•	•	•	•	•	•	•	•
	MacRAT ³	n/a	•	•	•	•	•	n/a	•
	PCRAT ³	n/a	•	•	•	•	•	n/a	•

¹ Remote user access allows network access with only a Mac and a stand-alone modem.

² Remote bridging allows remote access between two separate AppleTalk networks.

³ Not available at press time.

and you want fast access, buy a NetSerial and spend the money you save on two fast modems.

The Joys and Trials of Remote Networking

Being on the *Macworld* network is great, but it does subject me to the normal trials and tribulations of networking. Being on a remote node, I am at the mercy of the equipment in San Francisco. Several times the *Macworld* file server or mail server was accidentally turned off over the weekend. On those Monday mornings, I couldn't access those network services until someone in San Francisco got into the office and turned them on. This can be very frustrating, especially as my working day starts three hours earlier than that of my San Francisco colleagues.

Managing a network that spans the nation is difficult. For example, I'm constantly calling our network

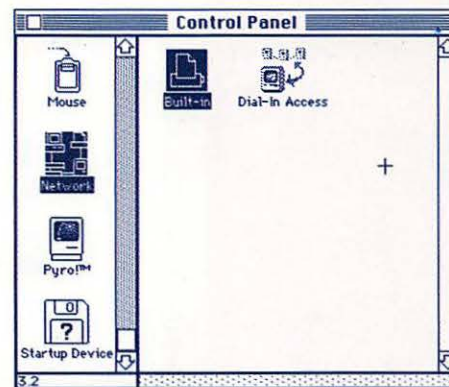
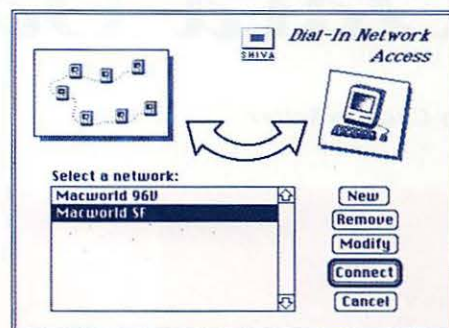


Figure 3

The desk accessory that comes with Solana's R-Server was originally developed at Dartmouth College. A new version of R-Server software lets you connect with the remote network from the Network option in the Control Panel.

Figure 4

With Shiva's NetSerial, after choosing the remote network to which you want to connect, you click on the Connect button to dial the number. The Network option in the Control Panel lets you choose between regular AppleTalk or Shiva's Dial-In Access.



administrator to find out if it's the file server that has crashed, or if my remote node connection is malfunctioning. Because running several versions of system and network software simultaneously can play havoc with a network, our network administrator must take special care to ensure that I get compatible versions of all that software up and running.

The only difference in network services I've noticed on the remote node—as opposed to using a local node—is speed. As far as AppleShare is concerned, I now keep as many windows closed as possible while using it. Updating windows takes a long time at any baud rate. Furthermore, after waiting several minutes for the HyperCard Home card to show up on my Mac's screen, I decided never again to try running a large application by remote node.

Speed, however, is a small price to pay for network access. Since my remote setup has been so successful, we've now decided to add our contributing editors as remote-node connections. With a remote node capability, just because I'm out of the office doesn't mean I'm out of the action. □

See *Where to Buy* for contact information.

Remote Bridging² Notes

- Compatible with Timbuktu
- One-person remote access possible only with one-Mac AppleTalk network
- Disk server only
- Functions as dial-in access modem with no other hardware
- Functions as dial-in access modem with no other hardware
- Compatible with Tangent Technologies' PC TangentShare
- For remote Mac laptops; compatible with Tangent Technologies' PC TangentShare
- For remote MS-DOS laptops; compatible with Tangent Technologies' TangentServer

Data Basics

by Charles Seiter

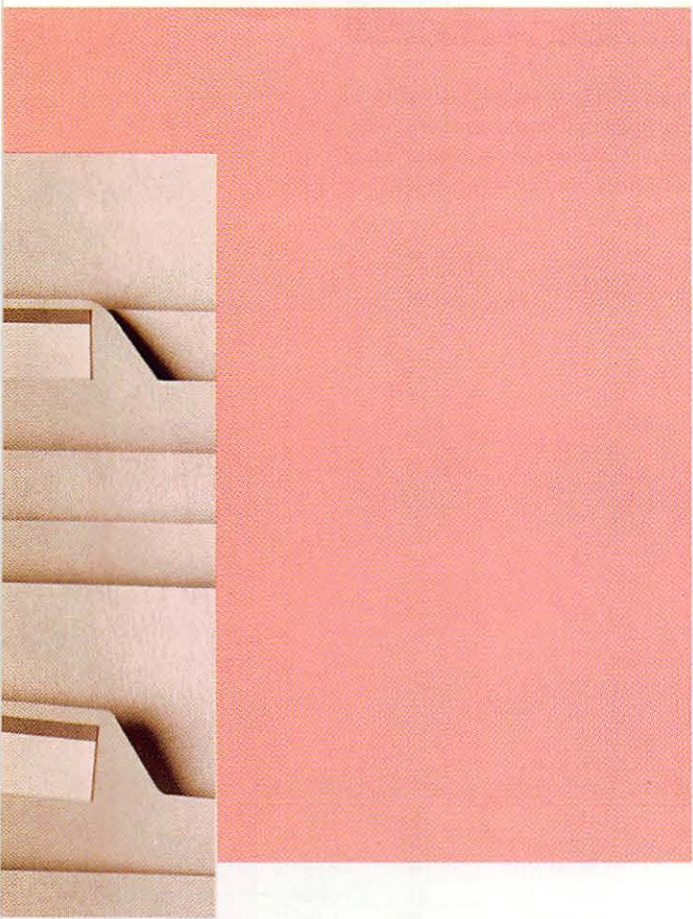


Database-management programs are a source of much fear and trepidation to new users. That's probably because of the impressive complexity of the high-end, fully programmable ones. But while some database-management programs are indeed complex, others are reasonably simple.

Charles Seiter is a chemistry-professor-turned-computer-writer and a Macworld contributing editor. He's written several books on programming languages and financial modeling.

When it's time for you to choose a database-management program, you'll be faced with two categories of products. At the high end of the complexity scale are relational database managers that feature built-in application languages, including dBase Mac, Double Helix II, 4th Dimension, and Omnis 3 Plus. These powerful and necessarily more complex programs are best suited to application developers and other advanced users. (If you think you might need one of these programs see "Cordial Relations.") These are the programs that scare ordinary mortals, who are usually unfamiliar with translating problems into logical constructions.

Seven easy-to-use database-management programs



But the odds are better than fifty-fifty that you don't need one of those complex programs. In the second category are products, often called *file managers*, that do competent work with mailing lists, inventories, and tables of data; such products typically include graphics and convenience features as well (see Figure 1). Best of all, they're relatively easy to use. Some include built-in forms designers for data-entry screens and reports, and even offer limited multiuser capability. Nonetheless, these programs are mainly intended to serve the person who actually buys the program.

Seven programs fall into this class of data managers: Business Filevision, FileMaker Plus, 1stFile, Microsoft File, OverVue, RecordHolder Plus, and Reflex Plus for the Macintosh.

Playing the Field

Database programs, beyond the performance measured with timing benchmarks, vary greatly in the details of data-entry features, forms design, report features, and special touches intended to appeal to power users. These programs also exhibit the widest price variation of any type of commercial Macintosh software. Fortunately, the seven programs we'll be looking at here are in the bottom half of the price range for Macintosh database managers.

As you look over the following product descriptions think about your own information-handling requirements. Keep in mind that easy and accurate *input* of data and attractive and flexible *output* design are often more important in day-to-day database use than the performance criteria that you can measure with a stopwatch.

If you want attractive entry forms and reports, you'll have to trade speed for looks. For simple sorting and merging of mailing lists, almost any product will do. As your needs expand—to generating reports with fancy graphics, or manipulating groups of related files—the choices narrow to a few special products (see "Features File" for specific features). The following product profiles should help you make a decision.

Microsoft File

Microsoft File was the first popular Macintosh database program, and it's a safe bet that File has sold many more copies than any other Mac database manager. In a way, the other programs in this survey can be defined in terms of the extra facilities they offer to compete with File. As you might expect, this program has an exceptionally simple interface to Microsoft's own Word for mail merging, and export to Microsoft Chart is similarly effortless.

Microsoft File is somewhat short on bells and whistles by current standards, but its List Helper facility (see Figure 2) is probably the easiest way yet invented to create a simple data file. Since it was the first database manager, File offers no instructions on ex-

changing data with other database programs. Current rumors suggest that Microsoft has a major revision underway.

Summary: Microsoft sold all those copies of File on the strength of its straightforward interface. If you want special effects, look elsewhere; but if you simply have some lists to manage, it's still an acceptable choice. Microsoft File just doesn't offer much for the money any more.

RecordHolder Plus

This program is a simple and inexpensive file manager that lets beginners design particularly helpful data-input forms that include radio buttons, check boxes, and limited error-checking (see Figure 3). For example, in fields specified as Table Lookup rather than Plain Text, the program checks input against a table of possibilities and warns you about entries that aren't in the table. This helps greatly in eliminating misspelled field data. A Tools palette for simple graphics lets you draw boxes, ovals, and bars, and easily rearrange the appearance of your forms. RecordHolder Plus handles all fonts and size combinations in reports.

A Utilities menu provides dialog-driven import and export of data files for using RecordHolder Plus

Topic	Object	Issue	Page
45 Graphics	List Helper	1.04	42
46 Graphics	Vertical Form	1.05	48
47 Graphics	Format Field...	2.01	53
48 Graphics	Set Font...	2.02	58
49 Graphics	MacPaint shortcuts for font control; Print Catalog command	2.06	65
50 Graphics	How Macworld illustrations are designed and processed	2.06	62
51 Graphics	Summary of MacDraw, MacDraft, and Tekalike features	2.09	67
52 Graphics	Changing the font, style, and size of text pasted from the Clipboard	2.09	58
53 Graphics	Saving custom patterns in MacPaint	2.11	71
54 Graphics	Copying wide MacPaint images via the Clipboard (2.10)	2.11	67
55 Graphics	MacPaint geometry	2.12	50
55 Graphics	Jumbo MacPaint pictures with MacDraw		

Figure 2

Microsoft File's List Helper made the program popular early in the Mac's history. This feature makes list management as easy as drawing in MacPaint. Newer file managers can be defined roughly in terms of the extensions they offer beyond File.

Figure 1

A basic database—often called a flat file, resembles a list or table and consists of records. For example, in a database used as a customer list, each record contains information about a specific customer. Each item in the record, such as name or address, is called a field.

Name	Address	City	State	Zip
Barton, Virginia	57 Bellair Drive	Dobbs Ferry	NY	10522
Brown, Betsy	505 Pine Bluff Trail	Chapel Hill	NC	27514
Canwright, Anne	829 Mulford Street	Evanston	IL	60202
Carle, Kirsten	96 Rosedale Street	Rochester	NY	14620
Castimore, Peter	812 West 28 Street	Richmond	VA	23225
Crabtree, Calvin	1658 Fowler Avenue	Fresno	CA	92737
Friis, Dennis	16880 Rancho Canyon Road	Sutter Creek	CA	95685
Hale, Sedrick	Route 1, Box 370	Callao	VA	22435
Manning, Jeff	212 Poplar Avenue	Mancos	CO	81328
Miller, Ginny	404 Poplar Avenue	Lee's Summit	MO	64063
Neill, Chris	1920 Stanford Ave	Baton Rouge	LA	70808
Raczek, Linda	11700 Palm Springs	Albuquerque	NM	87111
Sisson, Mark	2535 Perkins Lane West	Seattle	WA	98199
Tribert, Renee	2220 Walnut Street #820	Philadelphia	PA	19103
Trout, David	5800 Green Valley Circle	Culver City	CA	90230
Wheaton, Ward	18525 Maple Ridge Road	Deephaven	MN	55391
Winstead, Aubrey	P.O. Box 419	Key Colony Beach	FL	33051

HyperCard: A Database or Not?

HyperCard is now included free with new Macs. It's easy to use, and it appears to do many of the same things database managers do. But is it a database-management program? Can HyperCard fill in for the products in this review?

HyperCard is a database manager in the sense that it can store data. Address books, for example, and files of plain-text data are typical HyperCard stacks. It's also particularly strong on graphics—many of the most impressive demonstrations of HyperCard resemble Business Filevision applica-

tions, with expandable maps and diagrams.

It doesn't directly compete with the products reviewed here, because it won't automatically do multiple-field searches, multilevel sorts, or mail merging. However, while these features are not built in, HyperCard's scripting language lets you design small programs that perform the same functions.

Writing scripts for data manipulation, although easier in most ways than programming in traditional languages, is not exactly a trivial exercise for

beginners. If you want to try putting HyperCard to work as a conventional database-manager substitute, look into Heizer Software's StackWare collection. This group of stacks contains HyperCard utilities, priced from \$6 to \$25, that let you expand search/sort functions, import and export data from other programs, and set up files for mail merge with Word and other programs. For light-duty database work, these utilities will do the job, but in routine office practice I recommend a real, dedicated database product.

with other programs. RecordHolder Plus performs mail merges with MacWrite documents, using Software Discoveries' companion product, MergeWrite.

RecordHolder Plus isn't a bad product for the money. It's easy to use and has enough little tricks that it seems like a discount version of FileMaker Plus. The input features of RecordHolder Plus make it possible to design nearly "idiot-proof" input, and the program is a value leader on a features-per-dollar basis. The documentation is weak, and you can't create any file-to-file links making the program appropriate for users with only a single main file to handle. You relinquish some speed, but for lists of 100 to 200 names it's fast enough.

Summary: RecordHolder Plus is the price winner, and it's more than adequate for managing small,

simple databases. Choose one of the other programs for more ambitious undertakings.

FileMaker Plus

Nashoba Systems puts its emphasis on what it calls database publishing, meaning data-file presentation in attractive output formats. FileMaker Plus, the most graphics-intensive of these database managers, features a basic palette of graphics tools in addition to the usual PICT-file import capability (see Figure 4).

It takes some work to define FileMaker *layouts*, a generic term for input or output forms. However, since you can associate multiple layouts with one data file, FileMaker lets you view different collections of fields taken from a single database without performing separate searches for each collection. A script feature (analogous to a macro facility) lets you automate tasks from a selected list.

FileMaker Plus offers a conscientious tutorial, truly exemplary sample files, and a clear manual section on file exchange. The attractive manual, a two-color hardbound book, makes spiral-bound manuals feel flimsy and awkward in comparison.

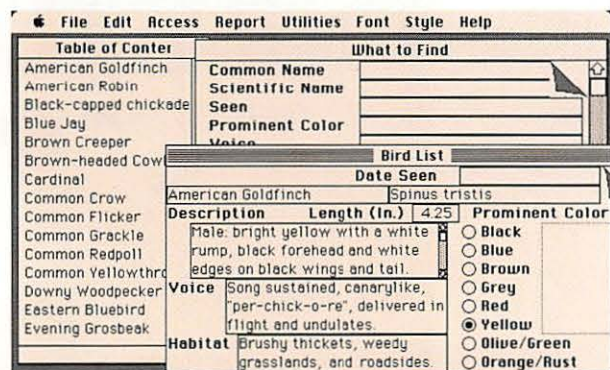


Figure 3

RecordHolder Plus database screens typically include: a Table of Contents (on the left) for fast selection of listed items; What to Find, for general searching; and an array of click-selected inputs (here, Prominent Color) to assist data entry.

Features File

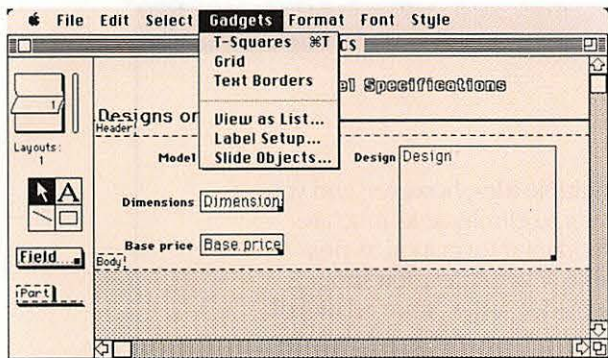
	Microsoft File	FileMaker Plus	RecordHolder Plus	OverVue	Reflex Plus	Business Filevision	1stFile
General							
Version number	1.04	1.0	1.0	2.1d	1.0	1.2	3.5
Opens multiple files		•			•		
Relational capabilities		lookup file		join	complete	link fields	join
Online help	•	•	•		•	•	•
Maximum record size	64K	disk space	disk space	disk space	disk space	disk space ¹	disk space
Maximum number of fields	1000	disk space	disk space	disk space	disk space	1600	100
Maximum field size	32K	disk space	32K			2K	0.05K
List Price	\$195	\$295	\$69.95	\$295	\$279	\$395	\$99.95
Entry Features							
Buttons, check boxes			•	•			
Preset formats	•	•	•	•	•		•
Type-ahead utility		partial	•	•			
Macros		•		•			•
Functions							
Math functions	0	6	7	7	22	6	10
Text functions	0	0	10	8	5	3	4
Date/time functions	3	4	4	9	11	4	0
Financial functions	0	4	0	0	8	0	0
Statistical functions	0	6	5	6	7	4	7
Reports and Graphics							
Page preview	•	•	•			•	
Report summaries (subtotals, totals)	•	•	•	•	•	•	•
Calculated fields	•	•	•	•	•	•	•
Picture fields	•	•	•			•	
Imports pictures	•	•	•		•	•	
Imports text	•	•	•	•	•	•	
Makes charts				•			
Edits graphics		•	•			•	
Import/Export							
ASCII-delimited	•	•	•	•	•	2	2
DIF				•		2	2
SYLK		•		•		2	2
Mail merge to Word	•	•	•	•	•		
Performance (in minutes and seconds)							
Import 1000 records	4:39	1:11	3:50	4:48	1:10	6:25	1:25
Sort	2:38	0:03	0:49	0:30	0:13	4:30	0:50
Search 1 record	0:24	0:01	0:11	0:01	0:02	1:38	0:07
Search 30 records	1:34	0:04	0:19	0:03	0:06	2:05	0:35
Formatted file size	75K	63K	79K	190K	45K	204K	96K

¹ One record can use all available disk space up to 4MB.

² Can import and export ASCII-delimited, DIF, and SYLK files with purchase of separate \$40 program for Business Filevision and separate \$295 program for 1st File.

Features File

Use this table to compare features among file managers. The performance comparisons were carried out with a database of 1000 records, each record containing three numeric fields and three text fields. The formatted file size shows the amount of disk space each program used to save the same file.



Summary: FileMaker Plus allows you to design strikingly attractive input screens and report forms, if you have the patience to tinker with its sometimes-fussy drawing features. The documentation and tutorial are particularly clear and helpful. Of the database managers I looked at, FileMaker has the best mix of features. It's a product that assumes you bought a Macintosh because you care about the way documents look.

OverVue

ProVue's OverVue is a powerhouse of a file manager that offers fast searching and sorting, along with other features that emphasize productivity over appearance. OverVue has the strongest data-entry features of all the programs I examined. A feature called Clairvoyance (an all-fields version of the Table Lookup scheme in RecordHolder Plus) inspects data entries as you type them, searching for matches in existing records. For example, OverVue might supply "United States" as you type "Un..." You can create macros that will appear under the Do menu. And like some spreadsheet programs, OverVue lets you create common graph types, including line, bar, column, area, and pie (see Figure 5). Although it's not a relational database (as ProVue claims it is in its literature), OverVue can perform a relational join of two data files; key fields in the two joined files eliminate duplication during data entry and updating. This procedure can substitute for true relational capability if you need to manipulate only a few files.

What we're really talking about here is a turbo version of Microsoft File, with graphs and macros. Although OverVue sorts faster than FileMaker Plus, their search times are comparable. FileMaker Plus apparently gets around its record-structure overhead by internally indexing everything—I can't prove this, but my tests show that in comparison to other programs, FileMaker Plus creates extraordinarily large disk files when saving data (see "Features File"). Most people

Figure 4

FileMaker Plus specializes in provisions for forms layout. All available fonts can be used, fields are simply dragged into place, and artwork (as PICT files generated in other applications) can be added as inspiration dictates.

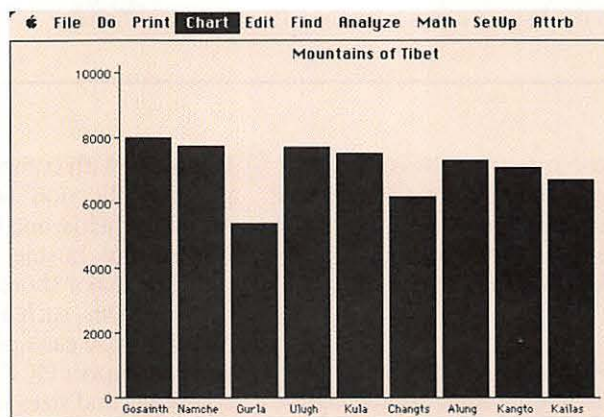


Figure 5

This bar chart was created in OverVue, a well-designed file manager with many extras. Besides macros, it offers a variety of built-in charting formats.

don't sort databases very often, so sorting speed isn't important to them. Much of OverVue's speed comes from limiting options—for example, you can only use the default font. (The manual helpfully suggests exporting reports to MacWrite if you want to use different fonts. Sounds like fun.) I did appreciate, however, the detailed instructions on data exchange with all popular spreadsheet and database programs; this is an important but often overlooked aspect of database-management programs.

Although the program has the strongest productivity orientation of all, its Achilles' heel is that it won't let you create graphically rich entry screens and reports. It doesn't have a graphics field type (PICT format) and can't handle more than one type font or size in a report, making its reports somewhat drab by Mac standards. This isn't a problem if you don't mind producing documents that look as if they were generated on an MS-DOS computer, but most Macintosh users have come to more expect attractive documents.

Summary: The lack of online help in OverVue is annoying, and the lack of graphics fields and the inability to mix fonts makes for drab reports compared

Cordial Relations

Database-management programs become more difficult to understand once you venture beyond the concept of file managers. More-advanced database programs let you correlate information in different files. You do this by defining a relationship between the lists of items

in two or more files—this way, a database working with one file can still look up items in the linked files. That makes it, roughly, a *relational* database. If you're only going to manage straight lists, you don't need to understand relational databases. If you plan to manage

multiple files, however, and you want to eliminate as much redundant information as possible among files, you should consider some of the relational databases available for the Mac, including dBase Mac, Double Helix II, 4th Dimension, Omnis 3 Plus, and Reflex Plus.

to most other Mac database managers. Nevertheless, OverVue is possibly the most competent manager for straight lists. If you value convenience features and are generally unconcerned about refined-looking reports and entry screens, OverVue is your best choice.

Reflex Plus

This program is the power user's database manager. Reflex Plus is a fast relational database manager—the only relational program in this set—that goes far beyond the capabilities of the original Reflex (see Figure 6). It's the most powerful program in this group of seven, and it would compete directly with Mac heavyweights Omnis 3 Plus and Double Helix (rather than with file-management programs) if Borland had equipped it with an applications language.

Seen in this light, Reflex Plus can't really be compared with the file managers reviewed here; it is more complex than the other programs I looked at. However, I chose to include Reflex Plus because it's the best intermediate-level product available. When you begin to outgrow the other Mac file managers, chances are Reflex Plus can meet your needs. This product works well if you want to tie multiple files together efficiently, but you don't want to deal with a database applications

language. With complex searching capabilities, a "repeating collection" facility for rapid manipulation of groups of fields, and flexible interfile link definition, it's a serious, business-oriented product. Reflex Plus has only one major shortcoming: it lacks most data-entry conveniences, such as check boxes and preset ranges. Although you can't produce artwork inside Reflex Plus, you can import PICT files and use any assortment of type fonts and sizes in reports.

The 576-page manual and a separate 180-page tutorial attempt to turn database beginners into efficient relational managers. For those who just want to start working with data right away, the manual includes a "cookbook" that shows how to adapt the large collection of Reflex Plus on-disk templates to particular applications.

Summary: Reflex Plus is a true relational database, it's fast and flexible, and it has an outstanding tutorial. Because it's relational, it requires more study than the other database managers, and it's more difficult to reconfigure the basic database structure after you've defined it. Other products are easier to use for managing single, uncorrelated files, but Reflex Plus is the product of choice for applications beyond straight list management.

Business Filevision

Business Filevision is a pioneering, graphics-oriented application from Marvelin Corporation that lets you produce "visual databases." Visual in this

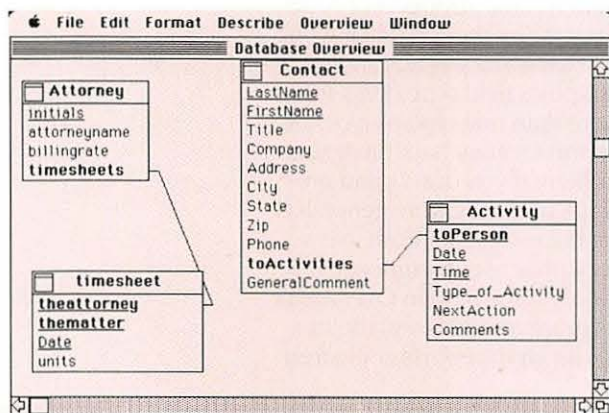


Figure 6

Included with the other file managers because it doesn't incorporate a programming language, Reflex Plus is nonetheless a complete relational database, suitable for serious business applications. Efficient use of Reflex Plus takes more planning than flat-file work does, but it results in impressive speed and flexibility.

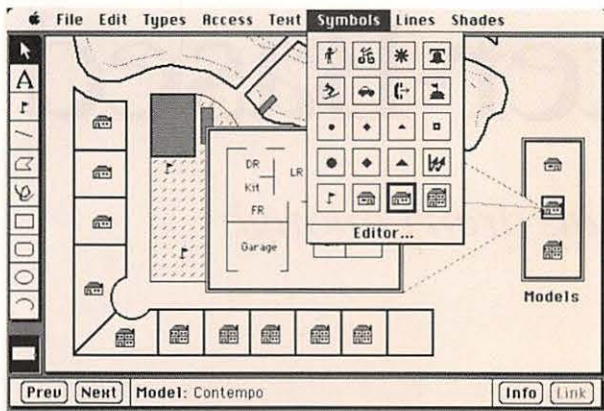


Figure 7

Business Filevision enables you to construct databases entirely of pictures. Here clicking on a particular house model evokes a floor plan. The Symbols menu suggests the variety of user-definable icons available.

sense goes far beyond the simple use of PICT files for output decoration. This program allows you to create parts of pictures—buttons, for example—where clicking reveals more levels of detail (see Figure 7). In one now-famous and quite spectacular application, Business Filevision was used to create a database for fire departments (see *Macworld News*, December 1986). In this database, clicking on parts of a city map reveals the buildings in individual blocks, and clicking on a building brings up a list of hazardous substances stored in that building.

Unfortunately, Business Filevision is slow and lacks most of the common data-entry conveniences, making it unsuitable for the majority of file management duties. It should be noted that this product is unique, however, and its strengths are not adequately demonstrated by benchmarking it against dedicated list managers.

Summary: Business Filevision's strength lies in handling visual databases that other programs can't touch. It has an imaginative program design that takes advantage of the characteristic graphics capabilities of the Macintosh. However, you should consider this program only if you have a database that you want to represent graphically. This is an expensive product if you just want to maintain an address file for your tennis partners. For most list management tasks, the competition is faster and better.

1stFile

In its current form, 1stFile is a loser. To easily accomplish otherwise standard functions—such as mail merge to standard word processors and file import and export—you must purchase two other programs from 1stDesk, one of which costs significantly more than 1stFile itself. For example, as shipped (version 3.5), this program offers no way to import tabbed text except with 1stPort, a \$295 communications/file-transfer utility. 1stFile has an extremely limited mail merge capability that can't be compared with its competitors. By combining 1stFile, 1stPort, and 1stMerge you end up with a functional equivalent to Microsoft File that costs several times as much. Although 1stFile will have nifty links to HyperCard, you won't be able to make up the links in 1stFile itself; you will need an as yet undevel-

oped product, 1stTeam, which a 1stDesk spokesperson claims may cost as much \$795. I should point out that not everyone shares my point of view about this product. In fact, *Macworld* ran a fairly positive review of 1stFile in January. Check it out for a different opinion.

As a stand-alone, 1stFile's main strength is speed. By using fixed-length records (a stock mainframe method also used by Omnis 3 Plus), 1stFile trades some flexibility for superior search/sort performance. Other positives include a competent set of mathematical functions for computed fields, macro capability, and the ability to perform relational joining of files. There aren't many convenience features for data entry, and there are no graphics of any sort. The program can't create reports with different fonts. The documentation could be characterized as endearingly weird or mildly confusing, according to taste—it's the worst manual of the bunch.

Summary: 1stFile is basically an upgrade of the Mac old-timer 1st Base, sharing the virtues and some of the vices of that product. It's a solid list manager on its own, but it requires 1stDesk's other modules to make standard chores like mail merge easy to accomplish. A spokesperson for 1stDesk claimed that an updated version of 1stFile would be available by the time this article appears, including ASCII-delimited file-transfer capabilities. But until then, it's an unfinished product that isn't competitive.

Choosing the Winner

So which Macintosh database manager is right for you? For most databases containing between 100 and 1000 records, FileMaker Plus is the best bet. This program is clearly the general-purpose, midprice winner. And FileMaker Plus lets you create slick-looking, graphics-loaded forms and reports.

What about the other programs? If data-entry features and sorting speed are more important to you than graphics, get OverVue. If your database-management needs are simple and you have very limited funds, you should probably stick with the cheapest product that can handle the job—RecordHolder Plus. At the other end of the spectrum, for more complex data management, you will need a real relational database, Reflex Plus. □

See *Where to Buy* for contact information.

Computer-Based

Where to go when manuals aren't enough

by Suzanne Stefanac

Contemporary techno-folklore has it that Macintosh users are so right-brain and intuitive that documentation serves little purpose beyond increasing the shipping weight of a product. And it's true that most of us like to shelve those shrink-wrapped manuals, leap into applications cold, and point and drag our way to varying degrees of mastery. As Mac software and hardware grow more complex, however, autodidacts in increasing numbers find themselves throwing their mice up in despair.

For Macintosh newcomers, who are less familiar with Mac logic and jargon, software mastery is even more difficult. Businesses switching to Macintosh technology, for example, face a major job of re-education. According to Mark Ramm, an instructor for the Institute of Advanced Technology (a member of the Apple Training Alliance) and a computer consultant to the Internal Revenue Service and Bechtel, companies typically earmark over 60 per-

cent of the cost of computer installation for training employees in the new system.

Training seminars are a common solution to the reeducation problem, and a variety of classes for Macintosh users have sprung up recently, many bearing the imprimatur of Apple or of companies like Aldus, Adobe, and Acius. The personal attention available in a class can be helpful, but the investment of time and money is prohibitive for many. Books that augment software documentation are another popular choice, and they're cheaper than classes, but most Mac users want to learn in a hands-on setting.

One answer is interactive computer-based training (CBT), in which students become familiar with program operations by working with examples provided on practice disks. The tutorial disks are augmented by audio- or videocassettes and often reference texts or workbooks. This approach lets students work at their own pace and at a time and place of their choosing. It's also more economical—especially for companies, which can reuse the materials when new employees need training.

This article surveys the interactive CBT products currently available for Mac users. Topics range from basic Macintosh operation to advanced programming. It was impossible to examine thoroughly all

of the more than 75 products listed in "A Training Treasury," but I was able to try at least one program from each of the companies represented.

Audio Tutorials

For Mac users who want training sans the printed word, popping a floppy full of examples into the drive while listening to recorded instructions may be the perfect approach. The audiocassette turns on and off at your discretion, and you can skip lessons or review them easily.

Personal Training Systems (PTS) offers the most comprehensive audio/software training for the Macintosh. Tutorials for each application are broken into modules aimed at different skill levels or topics, each module comprising a 60- to 90-minute cassette and a disk with practice routines (see Figure 1). The tone taken by the audio trainers, Dave and Liz, is reminiscent of high-school hygiene films, but the PTS approach is thorough and easy to follow. Summary cards accompany each package. Susan Barton, president of PTS, isn't far off the mark when she dubs its line of products "private tutors in a box."

While PTS specializes in Macintosh training, FlipTrack Learning Systems produces similar CBT packages for other com-

As a computer consultant for the San Francisco Unified School District among others, Suzanne Stefanac has witnessed the need for computer training firsthand.

Training



puters and has only recently added Mac tutorials to its extensive catalog. The distinguishing characteristic of FlipTrack courses is that at key points in each lesson students are encouraged to flip the cassette over to take advantage of advanced tips or extra practice routines. Flipping the tape back and forth and trying to keep track of where you left off with the cassette player's counter can prove quite distracting, but the FlipTrack approach does allow for a degree of customized training. The tutorials appear to cover all the major operations in an application, and the tone of the series is a bit more casual than that of PTS. There's also no need to take notes, since FlipTrack's User's Guides are thoroughly documented and well indexed.

Interactive Software Training

Techware's *Understanding PageMaker* is the most Mac-like of the software-based tutorials. With its hypermedia buttons and ever-branching options, you can either submit to an example-packed tour of the application or wander willy-nilly, following the dictates of whim or necessity. Covering the gamut from Mac terminology to reverse-image drop caps and custom kerning, Techware's approach is as intuitive as study should ever get. The feature that may wear the best over time is the Lookup option. Key in any page-layout term, and the program sorts a stack of cards for your perusal. The drawbacks of the program are that a beginner could get lost in the labyrinthine choices, and although the package is designed to install as a desk accessory, the entire four-disk package clocks in at a whopping 3053 K.

Defying Macintosh logic, some CBT programs actually require reading—of either on-screen text or a printed page. The manual-and-disk packages offered by Tutorland are surprisingly elegant and well conceived. Text, translated from the original French, is held to a minimum, and the bottom half of each page shows a screen shot of what should appear on your Mac during a procedure (Figure 2). Acius has announced that it will mail information on Tutorland's *Teach Yourself 4th Dimension* to its end users and dealers.

If you're interested in delving into Pascal, check out Borland's *Turbo Pascal Tutor*. This manual-and-disk tutorial proved comprehensible even to me, a programming novice. (The first unit is aptly titled

A Training Treasury

Audiocassette-Based Training

FlipTrack *Requires Mac Plus or SE with one 800K disk drive and hard disk, or two 800K disk drives; standard cassette player.*

How to Operate the Macintosh—three 2-hour cassettes, training disk, guide	\$89.00
How to Use Microsoft Word—four cassettes, data disk, guide	\$99.00
How to Use PageMaker 3.0—five cassettes, data disk, guide	\$195.00
Introduction to Design for Desktop Publishing—eight cassettes, study guide, design tools	\$295.00

Personal Training Systems *Requires Plus, SE, or II; standard cassette player.*

Excellerate —eight 60-minute modules	
Adding Power to Your Spreadsheet	\$39.95
Advanced Macro Techniques	\$39.95
Advanced Spreadsheet Techniques	\$39.95
Building and Using Databases	\$39.95
Building and Using Macros	\$39.95
Creating Business Graphs	\$39.95
Fundamentals of Excel	\$39.95
Linking and Consolidating Spreadsheets	\$39.95
HyperEasy —four modules	
Advanced Scripting (90 minutes)	\$49.95
Basic Scripting (90 minutes)	\$49.95
Creating Cards and Stacks (90 minutes)	\$49.95
Using HyperCard (60 minutes)	\$39.95
LearnMore —three 90-minute modules	
The Outliner	\$49.95
Tips and Templates	\$49.95
Tree and Bullet Charts	\$49.95
LearnWord —three 90-minute modules	
Advanced Course—Microsoft Word 3.0	\$49.95
Beginning Course—Microsoft Word 3.0	\$49.95
Intermediate Course—Microsoft Word 3.0	\$49.95
MasterWorks —three 90-minute modules	
Advanced Database	\$49.95
Beginning Spreadsheets	\$49.95
Database and Form Letters	\$49.95
PageTutor —three 90-minute modules	
Beginning PageMaker 2.0	\$49.95
Intermediate PageMaker 2.0	\$49.95
Tips and Techniques	\$49.95

Software-Based Training

Borland International *Requires 512K RAM and Turbo Pascal.*
Turbo Pascal Tutor \$69.95

Heizer Software *Requires 512K, Plus, SE, or II.*

Excel Tutorials (sold individually)	
Advanced Chart Tutorial Set	\$36.00
Chart Tutorial	\$15.00
Command Macro	\$15.00
Database Tutorial	\$15.00

Date/Time/Calendar Function	\$8.00
Financial Function Tutorial	\$8.00
Format Number	\$6.00
Function Macro	\$15.00
Guided Tour of Excel	\$15.00
Macro Recorder	\$9.00
Special-Purpose Function	\$15.00
Statistical Function Tutorial	\$8.00
Surface Charts	\$25.00
Text String	\$7.00
Top 10 Excel Questions	\$8.00
Worksheet Function Tutorial	\$15.00

Excellent Exchange Collections

Advanced Tutorials	\$50.00
Introductory Tutorials	\$50.00
Personal Resources	\$50.00
Utilities	\$50.00

HyperCard Tutorials (stacks)

Animation Tutorial	\$8.00
Calculated Fields Tutorial	\$8.00
Sorting Tutorial	\$5.00
Stack Exchange Sample Disk	\$4.00
Sticky Buttons Tutorial	\$8.00
Top Ten HyperCard Questions	\$8.00
Word Tutorial	\$40.00

Works Tutorials

Chart Tutorial	\$9.00
Communications	\$9.00
Database Tutorial	\$12.00
Draw Tutorial	\$5.00
File Import and Export	\$7.00
Financial Function Tutorial	\$8.00
Integrating Works	\$10.00
Printing Works	\$6.00
Spreadsheet Design	\$10.00
Spreadsheet Formulas	\$15.00
Spreadsheet Guided Tour	\$9.00
Statistical Function Tutorial	\$8.00
Word Processing Tour	\$6.00
WorksXchange Sample Disk	\$4.00

Hypersoft *Requires Plus, SE, or II; two 800K floppy drives or preferably hard disk and System 4.0; HyperCard.*

DTP Advisor	\$89.00
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Individual Software *Requires 512K, Plus, SE, or II; color on II.*

Typing Instructor Encore	\$49.95
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Layered *Requires 512K, Plus, SE, or II; external or hard drive. Modules work as desk accessories.*

Notes...for Excel	\$79.00
Notes...for Jazz	\$79.00
Notes...for PageMaker	\$79.00
Notes...for Ready,Set,Go! 4.0	\$79.00
Notes...for Word 3.0	\$79.00
Notes...for Works	\$79.00

Palantir *Requires 128K, 512K, Plus, SE, or II.*

MacType	\$59.95
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QED Information Sciences *Requires 512K, Plus, SE, or II.*

Turbo Pascal Tutor	\$69.95
Typing Made Easy	\$59.95

Techware *Requires 512K, 512KE, Plus, SE, or II. Comes with four 800K disks.*

Understanding PageMaker	\$95.00
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Tutorland¹ *Requires Plus, SE, or II. Comes with stand-up binder and disk.*

Teach Yourself Excel	\$69.95
Teach Yourself 4th Dimension	\$69.95
Teach Yourself PageMaker 2.0	\$69.95

Video-Based Training

Computer Training Resources *Comes with 90-minute videotape, workbook, disk.*

VideoTutor	\$199.95
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Image Express *Comes with 2-hour videotapes, practice disks with templates, Mylar type-specification tool, 90-day technical support.*

PageMaker Live-Advanced	\$99.00
PageMaker Live-Beginning	\$99.00
PageMaker Live-Intermediate	\$99.00

SofTrain² *Comes with videotapes, manual, quick-reference flipchart, and disk with templates.*

ExcelTrain	\$129.00
WordTrain	\$129.00
WorksTrain	\$129.00

Voice & Video

HyperCard: A Video Tutorial	\$49.95
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¹ Additional Tutorland products will soon be released for HyperCard, Microsoft Word 3.0, Microsoft Works, Omnis 3, and desktop publishing.

² SofTrain is currently working on two new modules: HyperTrain for HyperCard and 4DTrain for 4th Dimension.

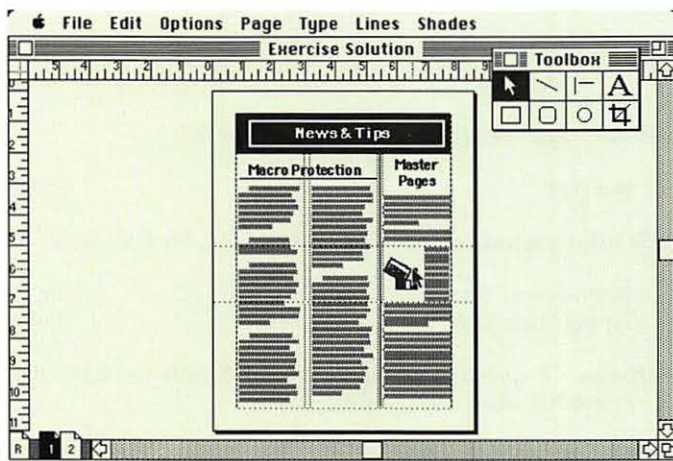


Figure 1

Within each module in *Personal Training System's* PageTutor, a document is developed. This screen shot of the solution to the Advanced module shows a newsletter that is somewhat pedestrian in design but that illustrates reverse type headlines, multi-column layout, the placement of graphics, and runaround text.

"Turbo Pascal for the Absolute Novice.") Borland's tutor takes you from basics to advanced programming concepts and includes 30 sample programs with source code on disk. One of the programs you help to develop is itself a training program: MacTypist, an animated typing tutor that crashes your on-screen car whenever you key in a mistake (see Figure 3).

The demand for supplemental aids in mastering complex applications has spawned a proliferation of mini-tutorials. Heizer Software serves as a clearinghouse for over 750 programs from 80 authors who focus on Microsoft Works, Word 3.0, Excel, and HyperCard. "There's nobody holding your hand for \$50 an hour," laughs president Ray Heizer, but these very inexpensive self-guided tutorials answer a variety of specialized needs.

Other compact tutorials, such as HyperSoft's *DTP Advisor* HyperCard stack and Layered's line of *Notes* desk accessories, come in the form of online help. *DTP Advisor* addresses a real need within the electronic publishing community. Page-layout programs have revolutionized low-end publishing, but in the process they've fostered a sad array of poorly laid out newsletters, brochures, and ads. In addition to explaining basic production and de-

sign principles, *DTP Advisor* provides a project-management database and set of interactive forms useful in publishing endeavors. I found the prerelease version of this stack to be beautifully designed and an excellent resource for fledgling publishers.

Layered's *Notes* for various programs install as desk accessories, and although they are much like manuals in that they serve better as sources of information than as learning aids, they do provide an instant reference, valuable tips, and templates for each application.

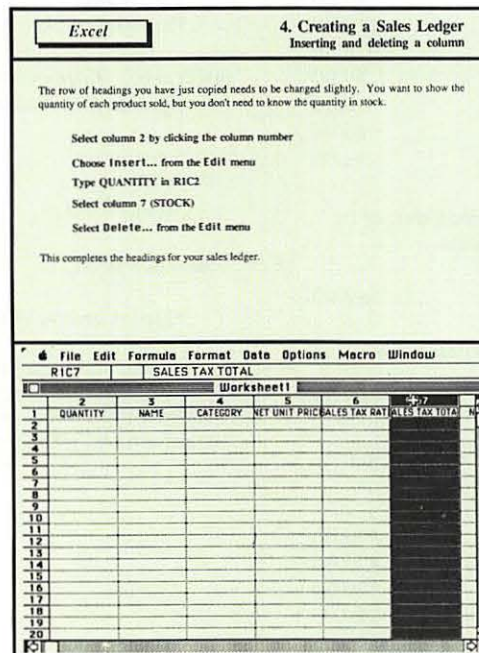


Figure 2

On each page of Tutorland's training manuals, screen shots of what should appear on the student's Macintosh accompany written instructions. This page is from Teach Yourself Excel.

Just My Type
I once knew a man who could type 65 words per minute using only two fingers. I can't help wondering what his speed would have been had he tried one of the interactive typing tutorials available for the Mac. Such packages subject students to a series of drills and tests, promising to turn even the most dedicated hunt-and-peck typist into a keyboard speedster in a few short weeks.

Individual Software's *Typing Instructor Encore* was the most entertaining typing tutorial, with its playful drill phrases and *Lobster Sea Adventure* game. But the steady progression of drills and the cunning way in which speed, accuracy, and weak keys are recorded in QED's *Typing Made Easy* have made this tutorial a best-seller in the corporate realm. Recently revamped for the Mac, the program includes an arcadelike game that lets you gobble up letters in pursuit of roller-skating demons.

MacType from Palantir is a flexible program that can introduce beginners to the basics and hone the skills of more-experienced typists. A metronome option is awkward except at very slow speeds, but a Stat Box allows students to peek at their speed, accuracy, and consistency at any time during a drill. MacType can keep progress records on more than one hun-

dred students at a time, and for those bored with the standard (QWERTY) keyboard, a utility allows any Mac keyboard to function as a speed-optimized Dvorak keyboard.

Screen Time

Frank Lloyd Wright called television "chewing gum for the eyes," but video training is finding more and more advocates these days. Watching a training segment that incorporates animation, skits, and comedy and then repeating the exercises on the Mac makes the learning process fun and may prove an attractive option, especially in schools.

Producer Randy Rossi at Image Express admits to being a "Three Stooges" fan and it shows. His PageMaker tutorials are as entertaining as they are informative. Following along on disk, students learn through a series of three 2-hour video tutorials that begin with basic layouts for business cards and newsletters and culminate in sophisticated color separation techniques and PostScript output considerations. All lessons include a well-designed reference manual, and Image Express offers 90 days of free phone support.

Video training for MicroSoft Works, Word, and Excel is available from SofTrain. The presentations use experts to guide you through the options in each application. A businessman whose offices were used as a beta site for Works, for instance, leads students through the *WorksTrain* video. A manual, a flip chart, and a disk with templates supplement each course; and versions will soon be available for HyperCard and 4th Dimension.

Computer Training Resources (CTR) of Honolulu is reworking its *VideoTutor* to accommodate PageMaker 3.0 and to resolve some fairly serious flaws (examples taken from the PC version; workbook errors). CTR president Allen Baker promises a refined package that addresses the full spectrum of publishing concerns, from design concepts through management, as well as soon-to-be-released video training in Excel and Interleaf.

Course Review

If you regret not utilizing some applications to their fullest potential, if mysterious options in the menu bar persist in taunting you, consider investing in one of



Figure 3

Students in Borland's Turbo Pascal Tutor learn by developing the application MacTypist. During the typing tutorial, whenever a student keys in an entry incorrectly, the car crashes.

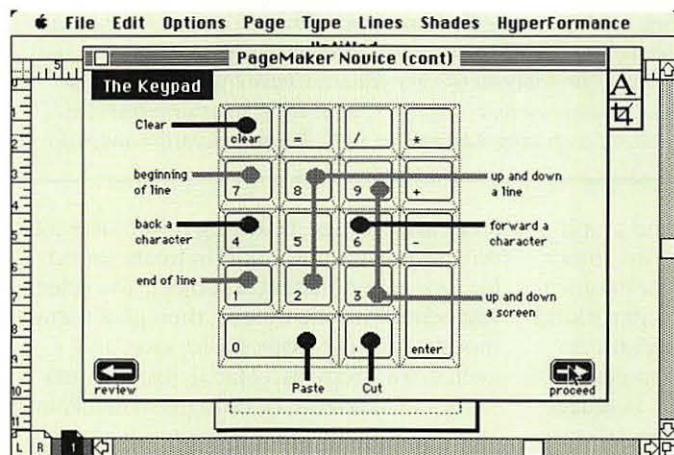


Figure 4

The advanced disk in Techware's Understanding PageMaker contains a variety of tips for speeding up layout. This screen shot shows short cuts available on the numeric keypad.

these tutorials. It's important to keep in mind, however, that no training program will turn you into a power user overnight. Mastering any complex application requires diligence, patience, and hours of trial and error.

As with almost any type of class, the more you know about a subject the harder it is to find a teacher who satisfies you. Although several of the advanced tutorials do an excellent job of explaining esoteric program features and offer tips that might take aeons to pick up on one's own, in general beginners will benefit most from training packages. People who already know their way around a subject know how to find the information they want in the manual or in books, and may become impatient with monitoring parts of a presentation they already understand.

If you really think you would learn more easily if you had a human to interact

with in addition to a Mac, be aware that high-priced, corporate-oriented training seminars aren't the only alternatives to computer-based training. You may be able to find reasonably priced classes in your area offered by community colleges, computer dealerships, or user groups.

If, on the other hand, you like to learn at your own pace but just need a little help, using your computer to learn about computing is the obvious way to go. □

See *Where to Buy* for contact information.

Reviews

Sound—The Easy Way

MacRecorder Sound Digitizer 1.0 (with SoundEdit and HyperSound)

Sound recording, editing, mixing, and special effects system. **Pros:** Compact, inexpensive sound digitizer with built-in microphone, volume control and external microphone/line jacks; powerful but simple SoundEdit editing, mixing, and special effects software; simple HyperSound "tape recorder" stack for sound recording and playback that transfers sounds easily to other HyperCard stacks. **Cons:** None. **Company:** Farallon Computing. **List price:** \$199. **Requires:** 1MB; hard disk.



Just as Macintosh text and graphics programs have become important verbal and visual communication tools, the MacRecorder sound system will probably become an important sound communication tool. Sound is universal: language and music are simply special cases of sound with complex rules and notation systems. Unfortunately, with the exception of the MacNifty system, most Macintosh sound efforts have been limited to music. Now, with the arrival of the MacRecorder Sound Digitizer, software can speak, sing, and make noise.

Object-Oriented Sound

The hardware "guts" of the MacRecorder sound system are housed in a 2½-by-4½-by-1¼-inch plastic case equipped with a built-in microphone and the necessary sound digitizing hardware, as well as external microphone/line jacks and a recording volume control. The built-in microphone is remarkably good, and generally sufficient for recording voice and ambient sounds. However, when high-fidelity recording is required, it's better to use an external microphone or a direct-line connection to the source (CD, tape deck, phonograph, VCR, TV, for example).

The SoundEdit software provides all five basic sound functions: data acquisition (recording), editing, mixing, special ef-

fects, and storage. Learning how to use it is remarkably easy. SoundEdit treats sound like any other Macintosh object. You select segments with the mouse, then play, name, modify, mix, cut, copy, paste, save, and even color them on a Mac II, just like text strings in MacWrite or bitmaps in MacPaint. Multiple simultaneous windows permit easy editing and mixing. In fact, SoundEdit even works in stereo as easily as it does in mono, although stereo sound has only limited application, primarily because HyperCard cannot use it yet.

Recording with SoundEdit is a bit more complex than using a home tape recorder, but only because you need to consider the trade-off between sound fidelity and disk storage. Maximum rate sampling at 22 kHz provides excellent fidelity, accurately reproducing sounds up to 10 kHz, but each second of sound takes up a lot of disk space (22 kilobytes). Sound sampled at 5 kHz takes up far less storage but can reproduce sounds up to only 2.5 kHz. The amount of memory required to store sound depends on the sampling rate and the length of the sound. Since the human voice requires a lower sampling rate than, say, a song recording, it takes up less memory. Judicious use of the prerecording level and frequency analysis monitors shows what sampling rate is necessary to accurately record a particular sound. In general, music requires higher sampling rates and thus more disk storage than voice. In addition, high sampling rates are usually better for



special effects and mixing, to minimize the inevitable loss of accuracy caused by applying various mathematical operations to the sound data. You can store the final processed sound at a lower sampling rate.

To form new sequences, you cut and paste sound segments just like text. Once you have selected a segment, you can apply special effects—ranging from simple amplitude changes and pitch transposition to echoes and envelope reshaping—just like changing the font or style of a text string. You perform mixing in a special window, using sound segments selected from other windows as mixer inputs; you can try various options and combinations before storing the output. Although SoundEdit provides a limited sound-synthesis capability to complement its special effects, it does not permit point-by-point sound editing; SoundEdit makes no attempt to compete with true sound-synthesis systems.

Free to Associate with Sound

Since the use of sound in HyperCard is likely to be the most important mainstream application of sound, Farallon has provided a special HyperSound stack that uses the metaphor of a cassette tape recorder to record, play, and store sounds. The metaphor is so simple and the function buttons so clearly labeled that anyone who knows how to use a tape recorder can use HyperSound with ease. Like most tape recorders, HyperSound provides an input level VU (volume unit) meter bar that permits you to adjust the recording level before beginning to record.

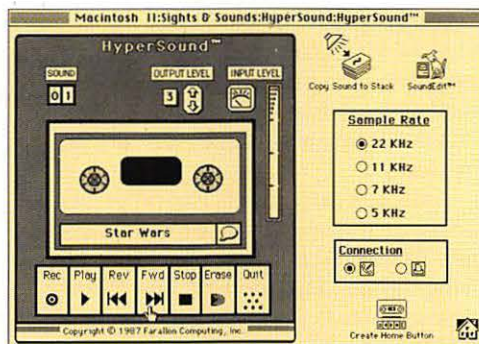
HyperSound stores sounds as user-named resources in a stack. You can paste the sounds into other stacks along with a play button and the necessary HyperTalk play script using a Copy Sound to Stack button. HyperSound even provides a Create Home Button that automatically creates a HyperSound button on the Home Card. Thus, you can use sound in a HyperCard script without creating a HyperTalk script, but like most things in HyperCard, sound is much more effective when incorporated into well-designed HyperTalk scripts.

The HyperSound "tape recorder" is simple and easy to use, but rather limited in function compared with SoundEdit. HyperSound has less room for storing sounds, so its recordings are generally much shorter than SoundEdit's, and HyperSound has no sound-editing capability. While HyperSound certainly is a useful entry-level sound tool, a very modest level of HyperTalk knowledge makes SoundEdit a

considerably better choice for manipulating sounds used with HyperCard.

Sounding a New Generation

Together, MacRecorder and SoundEdit form a very powerful, inexpensive, general-purpose sound recording and editing system. Sounds can be saved in SoundEdit, SoundCap, Studio/Jam Session, VideoWorks, HyperCard, and basic Macintosh ResEdit SND resource formats, making them available for use with many different software systems. Indeed, SoundEdit may well become the MacPaint of sound standards. But just as MacPaint didn't make in-



HyperSound

The HyperSound "tape recorder" greatly simplifies the use of sound in HyperCard, but there is a price. It's only a simple tape recorder. If you want to do anything more than just record and play back sound, you need the editing and mixing features of SoundEdit.

stant artists, SoundEdit alone will not make sound experts. It will simply make it easier to use our creative talents.

MacRecorder is not a music composition system and would be very difficult to use as such. Nor is it a full-scale studio multichannel recorder/controller/editor, but it doesn't claim to be those things. MacRecorder does what it claims to do; it does it well; and it provides a simple, powerful tool that will be very useful to Macintosh users ranging from amateurs tinkering with HyperCard to ad agency designers using VideoWorks. The MacRecorder sound system is an important new product because its simplicity and ease of use put sound within the reach of the rest of us. The era of silent software is over.

—Larry-Stuart Deutsch

See *Where to Buy* for contact information.

Setting Type with MacTeX

MacTeX 2.0

Integrated TeX typesetting system.

Pros: Includes built-in spooler; LaTeX, *MetaPost*, PostScript versions of LaTeX and Computer Modern mathematics typefaces, TeX-font metric files for most Adobe fonts; comprehensive on-screen help for TeX and LaTeX; easy graphics manipulation in Preview window. **Cons:** Text editor lacks automatic word wrap; poor error-trapping; a few bugs; writes over existing files without warning; cannot automatically download many downloadable fonts; incomplete and unclear manual. **Company:** FTL Systems. **List price:** \$750. **Requires:** 1MB.

Page One 1.0

Book-typesetting front end for MacTeX.

Pros: Virtually eliminates the labor of TeX coding; wide variety of clean, simple, predefined book designs; documents can be enlarged for higher-resolution output; all design templates are well illustrated in manual. **Cons:** Requires files to be in Microsoft Word 1.05 format; design templates difficult to modify; cannot handle front matter; multiple columns, illustrations; program installation and operation poorly documented. **Company:** McCutcheon Graphics. **List price:** \$2000 (\$1500 for MacTeX owners). **Requires:** 1MB; hard disk.



In contrast to page-layout programs such as PageMaker and ReadySetGo, Macintosh typesetting programs are relatively unknown. Yet for true book-quality and book-length typesetting and for mathematical and technical documents, markup-language typesetting programs are far more capable.

One of the three major typesetting programs for the Macintosh is FTL Systems' MacTeX. Like its competitor, Addison-Wesley's TeXtures (see *Reviews*, *Macworld*, February 1988), MacTeX is an implementation of the TeX document typesetting language. Thus it shares with TeXtures all of TeX's innate strengths and weaknesses. But MacTeX differs from TeXtures in how it incorporates TeX with the standard Macintosh interface, and in the TeX extras it offers.



MacTeX: TeX on a Mac

As with TeXtures, every MacTeX document goes through a four-step process: edit, typeset, preview, and print. MacTeX's editor, which is used in the first step, supports the cursor keys and the standard Macintosh editing commands. The editor also has Find, Replace, Word Count, and Go to Line commands, a Window menu, and ten definable macro keys. Inconveniently, however, text does not automatically wrap at the edge of a window (MacTeX 2.1, not yet released when this went to press, claims to support word wrap).

During the second step, converting raw TeX text into a device-independent (DVI) file, a typesetting window indicates TeX's progress and displays TeX error and diagnostic messages. Errors are bypassed, corrected, or otherwise handled by pressing one of the window's nine command buttons.

The Preview window shows how your DVI file will appear when printed. The pages of the document are displayed with one page per window, up to four pages at a time, a method that sounds reasonable enough but turns out to be both awkward and confusing. Previewed pages can be displayed at full page (fit-in-window), normal, or two or four times normal size. Sadly, MacTeX's Preview window lacks TeXtures' convenient magnifying glass, which instantly magnifies any portion of the page.

PostScript code can be added directly to a MacTeX file. Encapsulated PostScript (EPS) files, however, are called up with a TeX command and remain as separate files. PICT or Paint graphics must be manually pasted (via the Clipboard) into the Preview window. PICT, Paint, and EPS files appear as they do on the printed page, and can be resized and repositioned—but not cropped—in the Preview window (see "Sneak Previews").

MacTeX documents can be printed in the usual Macintosh way, or with MacTeX's built-in LaserWriter driver and spooler. Using the standard method, LaserWriter options such as smoothing are available. But MacTeX's built-in driver corrects some LaserWriter driver anomalies and makes printing faster. In either case, most downloadable fonts must be downloaded manually before printing.

More or Less than TeXtures?

MacTeX offers a number of features that go beyond those in TeXtures. For example, MacTeX can translate formatted Word 1.05 and MacWrite documents into coded TeX files, although the conversion is not always perfect. MacTeX can also convert DVI files into standard PostScript files. In addition, the MacTeX package includes

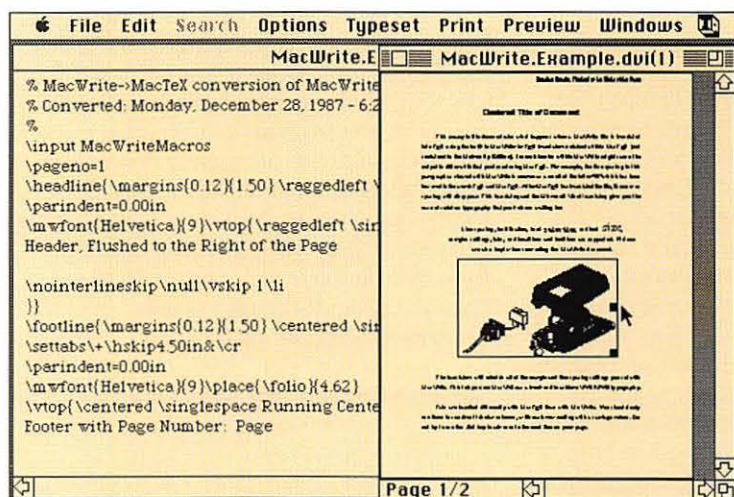
PostScript versions of the three major Computer Modern mathematical fonts (created specifically for TeX) and the five LaTeX graphic fonts, as well as the required TeX-font metric files for all but the most recent Adobe fonts.

MacTeX works with any TeX format, including the popular LaTeX document-preparation format, which is included in the MacTeX package. You can alter existing formats, or create new ones with another part of the MacTeX package, IniTeX. MacTeX also contains extensive on-screen help for Plain TeX and LaTeX formats, a unique feature among TeX implementations (see "Information about Formats").

In other ways, however, MacTeX falls short of TeXtures. For example, the Computer Modern typeface family—currently limited to a resolution of 300 dots per inch (dpi)—must be purchased separately, unlike with TeXtures. MacTeX also has many more rough edges than TeXtures. Error-trapping is poor and there are a few bugs; both result in occasional crashes. The built-in spooler sometimes loses print jobs, and MacTeX writes over existing files without warning. The MacTeX manual is no model of clarity or completeness either. (MacTeX also comes with a copy of Donald Knuth's classic, *The TeXbook*, and Leslie Lamport's inscrutable *LaTeX User's Guide and Reference Manual*.)

Page One: Automated TeXbooks

For those with book-length documents who want the typesetting power of TeX, the ease of use of a powerful word processor, and off-the-rack page design, McCutcheon Graphics has created Page One. With Page One, you enter all your text in Word 1.05 (or Word 3.01, using the Word 1.0/Works format option when you save the

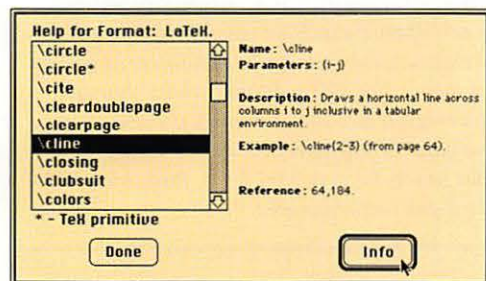


Sneak Previews

After typesetting the text, you insert PICT and Paint graphics in MacTeX's Preview window. You can resize PICT, Paint, and EPS graphics in the Preview window by adjusting the bounding rectangle, and reposition them by dragging with the pointer.

file). Text entry couldn't be simpler, since text must be unformatted except for italic and bold styles, an indented paragraph or two, and a small number of commands.

In Page One itself, you designate the Page One template number, the template variant, the starting page number, and mag-



Information about Formats

MacTeX includes unique and comprehensive on-screen help for both Plain TeX and LaTeX formats, including references to the appropriate pages in the TeX and LaTeX manuals.

nification for your document. The Page One package contains 50 templates in three standard North American trim sizes and one European trim size. The templates differ in basic design and the typeface used (the LaserWriter Plus resident fonts, plus Adobe's Garamond), but all are clean, simple, and attractive. Some are more suitable for fiction, others for nonfiction. All templates come in three variants that differ in the average number of characters per page. You can enlarge LaserWriter output for later reduction (and thus increased resolution) by the printer.

Page One takes note of your choices and then hands the reins over to MacTeX to typeset and print your document in the usual manner. Page One printouts include crop marks, reduction instructions, document title, and revision number.

Page One can handle documents containing a single subhead level, indented text excerpts, and footnotes (either on the page or at the end of the book). It cannot handle multiple columns, front matter, graphics, or tables. Page One provides ReadySetGo templates for standard front matter, and separate Page One templates for indexes and bibliographies.

To alter the templates themselves, however, even in the most trivial way, requires a good working knowledge of TeX. The Page One manual is skimpy and somewhat disorganized; there are no directions,

for example, for installing Page One on the required hard disk. But the manual does contain multiple-page samples of each template to assist you in choosing one.

Which TeX?

Although TeXtures is in many ways a smoother and more robust program, MacTeX's added power, convenience, and flexibility are worth the effort and expense, if you are serious about desktop typesetting and willing to learn how to avoid MacTeX's rough edges. And if you are serious about book publishing and quality typesetting, but not eager to get your hands dirty with TeX, Page One is a pricey but convenient way to have the best of both worlds. Be sure that Page One supports the trim size you have in mind, however, and that it offers at least a few designs that appeal to you, before taking the plunge.

—Robert Eckhardt

See *Where to Buy* for contact information.

A Different Kind of Apple Tree

MacTree

Hard disk file-management. **Pros:** Visual display of all folders on a disk; sophisticated file filter and search capabilities; launches applications and specific files. **Cons:** Requires a minimum 192K RAM partition and MultiFinder to run concurrently with other programs; unalterable alphabetical arrangement of same-level folders; files thrown in trash cannot be retrieved. **Company:** Software Research Technologies. **List price:** \$69.95. **Requires:** 512KE, HFS.



Maintaining a neat and orderly collection of files and folders on a hard disk is a thankless task. A number of utility programs, including file-management desk accessories like DiskTop and DiskTools II and Finder substitutes such as PowerStation, use different techniques to make organization easier. A new program, MacTree, offers an unusual but rather limited answer to hard disk file and folder management.

A Different Desktop ...

MacTree creates a desktop with a difference. Instead of the anywhere-you-please assortment of folders and files, each

disk or folder window displays the folders it contains graphically, in the form of a carefully pruned "tree." All folders are visible either as folder icons or—to save space—as simple vertical lines (the *collapsed form*). The disk or folder represented by the window appears at the top of the tree, and folders branch off below in clusters according to the way the folders are nested on the disk. As a result, you can see the entire organization of the hard disk at a glance.

You scroll right or left, up or down, to reach parts of the tree that extend off the screen; large screens work better for disks with many folders. The tree can be displayed in one of four sizes; the larger trees are easier to read, smaller trees let you fit more on the screen. Collapsed folders can be expanded to display icons and names. Folders that contain only other folders are represented by "thin folder" icons; folders containing files are represented by "fat folder" icons.

An information bar at the top of the window displays the name of the disk or folder represented, the disk space it occupies, the date an item within it was last modified, and the number of files within the window but not in any folder. At the bottom of the window, MacTree displays those files as icons or in a list. Either way, files can be ordered by name, size, date, or kind.

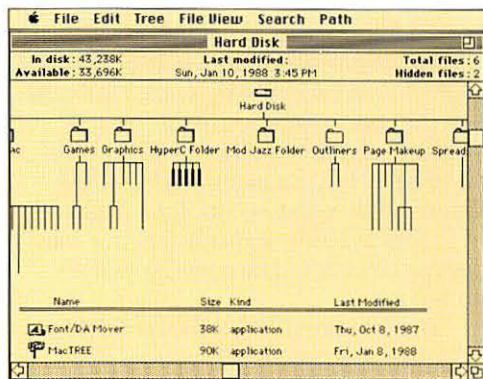
MacTree provides all the basic file- and folder-management functions. Files and folders can be moved from one folder to another, renamed, duplicated, and thrown in the trash, and new folders can be created. Since all folders are visible in the MacTree tree, you need not ascend and descend folder hierarchies to move files from one deeply nested folder to another; you need only drag a file from one folder to the other. Another convenience is that you can select multiple files in a file list by dragging the pointer. And when you drag to select either files in a list or folders in a tree, the window automatically scrolls when the pointer hits the edge.

You cannot, however, store files temporarily on the desktop. And you can't call up a file's Get Info window, although you can lock or unlock a file with a menu command. Nor can you create a list of folders; they only appear in the folder tree. And any file thrown in the trash is erased immediately.

... With New Capabilities

Other useful departures from the Finder include the Open All Files command, which converts any standard MacTree window into a list of all the files contained within that window—no matter what folder they're in—up to a total of 1500 files. You could, for example, use Open All Files to create a list of all the files on a hard disk. Each entry in the list contains file name, size, kind, and date last modified, plus the name of the folder that contains the file.

The Filter command allows you to select the kinds of files displayed in an Open All Files list: hidden files; system files; documents; applications; files created before or after a particular date; and files with names beginning with, ending in, or containing specific letters. You could, for example, create a list of all documents modified since the previous day to help you



Viewing the Forest with MacTree

The folder tree in this MacTree window is reduced in size to fit more in the window, and second- and third-level folders are collapsed (represented by vertical lines) to save space. The five folders in the HyperCard folder have been selected and can now be expanded into standard folder icons with the Open command.

perform a daily backup. You can also use the filter to locate files with identical names (useful for eliminating duplicate files). Unfortunately, the file filter reverts to a default setting each time you open a new file list.

MacTree also contains a Search command, which works along the same lines as the file filter. A Path menu displays the names of all the folders between the selected folder or file and the disk on which

it's found. You can change MacTree's default settings, including the zoom factor and the number of levels for which folders are expanded. And MacTree can print the contents of the active window, tree and all, on any Apple printer.

But Who Needs It?

As with DiskTop, DiskTools II, and PowerStation, you can launch any application or file from within MacTree. If MultiFinder isn't running, MacTree reopens automatically when you quit an application. To allow MacTree to work side by side with other applications under MultiFinder, however, you'll have to give up a sizable chunk of RAM—MacTree requires a minimum 192K of RAM, and prefers 300K or more for large hard disks. Those with limited RAM may find it difficult to justify devoting so much memory to a program that is, after all, just a file utility.

MacTree has a few other deficiencies as well. You cannot alter the folder tree in any way; folders always appear in alphabetical order within each branch. While you can have any pattern of expanded and collapsed folders you need on screen, when you save a tree, each level of folders must be either all expanded or all collapsed. And MacTree must scan the hard disk and re-create its folder tree each time you launch it, a process that can be time consuming for high-capacity drives.

MacTree is obviously not for people who want to arrange and rearrange the positions of files and folders according to their own criteria (Finder style). Nor is MacTree for someone who wants a quick, compact file utility (like DiskTop or DiskTools II) for simple file maintenance. Nor is MacTree for someone who wants to hide the complexity of a hard disk behind a modest screenful of important applications and files (à la PowerStation). But if the files and folders on your hard disk are really disorganized, if you often wish that someone would clean up the unholy mess for you, if displaying folders in a visual tree with each branch arranged in alphabetical order is better than anything you've managed so far, then MacTree may be for you.

—Robert C. Eckhardt

See *Where to Buy* for contact information.

For the Cost Conscious

MultiLedger 1.0

Small-business accounting program.

Pros: Straightforward, competent program; good support; excellent value for the cost. **Cons:** Does not check year-to-date balances as you enter them; allows cash disbursements that are not entered into any accounts; documentation has gaps. **Company:** CheckMark Software.

List price: Version 1.05 \$395. **Requires:** 512K, hard disk recommended.

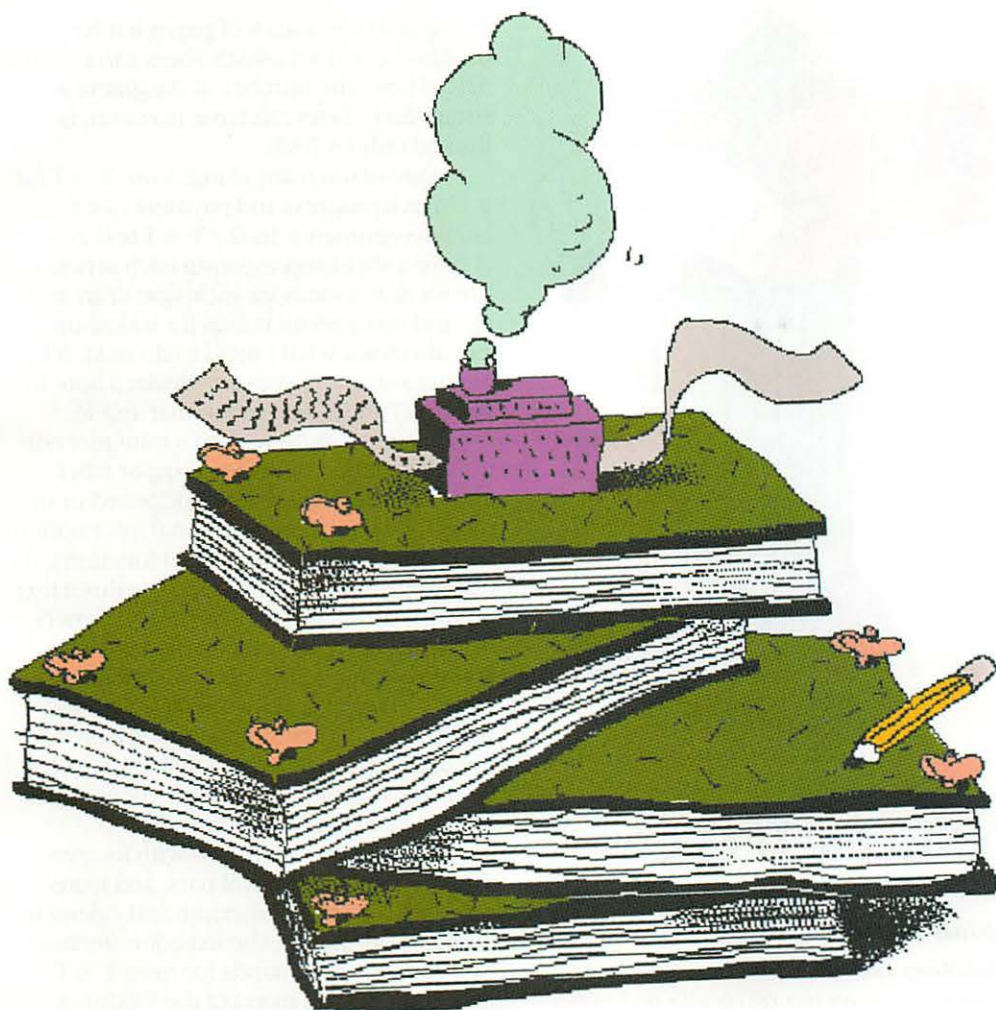


MultiLedger—with its General Ledger, Accounts Receivable (A/R), Accounts Payable (A/P), and Inventory ledgers—is a small-business accounting program that will keep the small company's books about as well as any large company's elaborate MIS system, and at a cost just under \$400. MultiLedger also integrates with CheckMark's Payroll program, automatically transferring data into the appropriate ledgers.

MultiLedger's menus are extremely simple and logically arranged. The usual Apple, File, and Edit options are followed by Set-Up, Transactions, and Reports. Program setup takes place, as you would expect, by working down the Set-Up menu. You begin by entering basic information about the company, with the option of setting up Profit Centers (or Departments). (Oddly enough, the same screen gives you the opportunity to select printing fonts.) Next you set up a chart of accounts. Although CheckMark provides a good general set of accounts in its sample program, you'll probably need some guidance from a professional in setting up accounts for your own business. You don't have to understand debit or credit accounts, since a display guides you in numbering entries with positive or negative values.

The next step is to link the chart of accounts to 11 basic predefined categories used by the program in manipulating and reporting data. For example, you tell the program which of the accounts that you have set up correspond to MultiLedger's Cash Account and Cost of Sales categories. The documentation takes you through this process item by item.

If you install the program during your fiscal year, you then enter account balances



to date, followed by budget data. Unfortunately, MultiLedger does not check year-to-date balances as you enter them, so if your figures are wrong or you make an entry error, the books will remain out of balance for the rest of the year.

The next item on the Set-Up menu allows you to establish customer and vendor accounts, inventory items, terms of sale (for example, Cash, Net 30), and add information about salespeople. When you set up the sales force, you can define the commission rate as well as whether you want to pay commission on the total sale amount or the gross margin of sale.

Predefining the terms of sale works fine for billing customers; but it's awkward when entering payables, because you're locked into the predefined terms when setting the due date for the bill—you can't override the date assigned based on the terms of sale you select. For payables I'd much rather enter a due date myself, or a

+7 for a bill to be paid in seven days, with the program filling in the correct date.

Entering Transactions

Most of your everyday use of MultiLedger will be through the Transactions menu. The menu has four sections; the first is inventory control, where you enter inventory items as you purchase them, and bill them out to your customers (and pay sales commissions) as you sell them. Although MultiLedger works mainly in an on-line mode, entries in the inventory control section are collected and then posted to the appropriate A/R and A/P ledgers contained in the menu's second section.

The second section contains the Sales and Payables Journals where sales and purchases are posted. If you do not use MultiLedger to track inventory and commission, you may create sales invoices directly in the A/R Journal. Vendor purchases not tracked in inventory are recorded in the A/P Journal. You also enter customer payments on invoices (for the Receipts Journal) and create disbursement checks for payables in this section.

Vendor payments must be selected individually, although multiple payable invoices may be combined on one check (see "Invoices Out"). MultiLedger does not offer automated processing of payments, such as for all discounted invoices or all invoices due by a designated date. The user must select the invoices for payment one by one—a tedious process with a large batch of payables. Partial payment on transactions is allowed.

The third section of the Transactions menu contains a Receipts Journal, a Disbursements Journal, and a General Journal. You may enter cash receipts directly into the Receipts Journal, and if you run your business on a cash basis, this is the only place you will enter deposits. You also create checks here that do not have to be processed through the A/P Journal. Although this is convenient, it challenges the integrity of the system. For instance, if you start your fiscal year in March and enter a bill from February, MultiLedger posts the bill without charging it to any account because the prior period has been closed out. General entries, such as depreciation or adjustments, are made in the General Journal.

The fourth section in the Transactions menu allows you to reconcile bank accounts, a feature not found in many low-priced accounting programs. The only problem is that MultiLedger deletes individual checks when you close out a month, so you may reconcile checks for the current month only. Any checks from previous months that have not cleared must be tracked manually, or in a separate program. It would be nice if MultiLedger put the checks in a separate file that wouldn't clear

Date	Disc Date	% Disc	C/V	Amt Due	Amt Pd	Disc/Adjust
9/10/87			RF 9-02 First	49.65	49.65	0.00
9/13/87			P O 1198 I L H	4792.00	3792.00	0.00
9/15/87			RF 9-07 U S P	500.00	500.00	0.00
9/20/87			RF 9-01 Mail R	200.00	0.00	0.00
9/20/87			RF 9-03 Mac H	30.00	30.00	0.00
9/25/87			PO 1244 Advan	1000.00	0.00	0.00
9/25/87			RF 9-04 Mac H	2528.47	1000.47	0.00
9/25/87			RF 9-05 Mount	217.91	0.00	0.00
9/25/87			RF 9-11 Joe's	1000.00	0.00	0.00
9/30/87			RF 9-06 Quail	3500.00	0.00	0.00
10/5/87	9/15/87	2	PO 1235 Unive	15246.50	0.00	0.00

Save \$5,372.12 Total Checks

Invoices Out

You select vendor invoices for payment one by one and group multiple invoices to the same payee on a single check. MultiLedger allows partial payments, but has no provision for batch processing.

Reviews

at the end of each month, so the user could have 100 percent check reconciliation.

Reports

MultiLedger's reports provide only elementary information such as the chart of accounts, trial balance, balance sheet, and income statement. Reports may be viewed and printed for any designated period during the current year. Current-month transactions are also supplied from the different journals. In addition, you may produce reports on customers, vendors, inventory, and salespeople.

The General Ledger Report is the only report that retains detailed information for the year's transactions prior to the current period. Changing the current month purges all detailed transactions, except for the General Ledger Report.

The reports for customers and vendors could be improved. Detailed year-to-date information is useful in answering questions about billings prior to the current month. The only place MultiLedger provides this information, however, is in the voluminous General Ledger Report.

Product Support

MultiLedger's documentation could be improved considerably in several places. For instance, don't look in the index for "recurring entries," because MultiLedger calls them Automatic Journal Entries and deals with them only under General Journal Transactions. That reference says that entries with a reference number beginning with the letters AJE will automatically carry over to future months as recurring entries. A phone call to CheckMark revealed that you can use AJE entries in the Accounts Payable Journal. The company is extremely helpful when you call with questions. CheckMark provides unlimited free telephone support to registered users (you pay for the call).

On the whole, MultiLedger's weaknesses and omissions are minor. The program is easy to use, operates with a standard Macintosh interface, and has all the features that most businesses need to keep financial records. I recommend MultiLedger for any small or medium-size business that can fit into the program's structure and that doesn't need elaborate reports.—Alan L. Slay

See *Where to Buy* for contact information.



It Slices, It Dices

Think 'n Time

Visual organization tool in a DA. Pros: Organizes multiple records visually and makes them easy to access and manipulate; clear and comprehensive manual; combines power of an application with versatility of a desk accessory; potential for varied and extensive use; small (50K); fast. **Cons:** Keyboard commands and menu are not always intuitive; it takes time to develop facility with the program. **Company:** Mainstay. **List price:** \$99.95. **Requires:** 512KE.



It's lucky for Think 'n Time that HyperCard has familiarized Macintosh users with programs that defy classification. Think 'n Time, informally called T 'n T, is a rudimentary data base, an organizational tool, a project organizer, a visual outliner, and a calendar, all in a desk accessory. In addition, it contains arithmetic functions, search features, and text-management capacity. T 'n T is harder to learn than many desk accessories, but in return for the effort, it provides a fast, feature-laden, and unique utility program.

Think 'n Time builds a simple tree structure of data sheets, using variations of the "dog-eared page" icon. These icons are linked to one another by straight lines. An icon shows "print" if it contains any text,

and appears as a stack of pages if it has daughters or sisters. Each sheet can contain 32K of text. The number of daughters and sisters each sheet can have, however, is limited only by RAM.

One of the many things I use T 'n T for is to track progress and payments for freelance assignments. In the T 'n T text areas (I have a sheet representing each article), I can jot down ideas for inclusion in an article and notes about things for follow-up. I can also track what I need to do next. If I have questions to pursue, I make a note in the T 'n T sheet devoted to that article.

Yet T 'n T is more than a mini text editor. All sheets contain a text tag or label and may also include a calendar and/or numerical tag, to show additional information and allow access to additional functions. In my writing tree, each article contains a text tag with the name of the article, a numerical tag showing the total of my expenses and the payment due, and a calendar tag with the due date of the piece. When I open an individual sheet, I can access all the data. Although I can only view two of the three tags at once, a single mouse-click lets me view the remaining tag.

T 'n T opens a window with its own title bar, menu bar, scroll bars, and icons representing text, numerical, and calendar modes. There are keyboard equivalents as well as menu commands for most T 'n T functions, yet the menu of the Finder or current application remains visible, and certain of its commands are also available (though not necessary). Having two menus in view can lead to some confusion. It's easy to overshoot the T 'n T menu and reach for the current application menu or the title bar of T 'n T's tree. On the other hand, other DAs, some of which append entries to an application's menu bar, can be accessed while T 'n T is open.

Good to Have Around

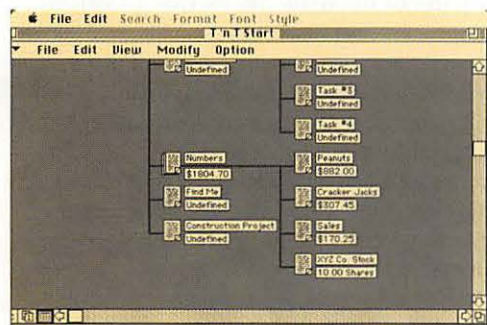
While T 'n T looks like a visual outliner and can manipulate large amounts of data, it provides more than outliner-type functions. T 'n T can dial a phone, maintain address and appointment books, and keep track of things to do in the order you want to do them. It can sort and find entries. It can export sheets to More or save them as text files. T 'n T quickly generates calendars, performs arithmetic, and produces technical subheads. A friend has referred to T 'n T as the Ronco Veg-O-Matic of desk

accessories. It slices, it dices, it polishes your nails.

Reorganizing trees is a snap—and you can easily generate new sheets, copy them, or move them around within a tree. And you can navigate through trees in a variety of ways. There is a cursor hand that speeds up when you hold down the Shift key. There are the scroll bars. There is a hierarchical menu that lets you access any sheet immediately. And there is an edit menu, which can search out particular entries and take you directly to them.

When T'n T prints, it can access only some fonts and font sizes. But, although this change is undocumented, you can alter the font list that T'n T reads, simply by using a resource editor such as ResEdit to insert the names of the missing fonts.

I've come across a few bugs when using T'n T on the Mac II. Whenever I open the program while Excel is open and QuicKeys is present, T'n T bombs. The manufacturer, Mainstay, says the problem lies with Excel, so Mainstay cannot fix it. Also, I sometimes get a bomb when I close T'n T from the window close box rather than with a keyboard or mouse command. (Mainstay has promised a free upgrade for Mac II owners when this is fixed.)



Playing Tag

Think 'n Time allows you to view two tags at once. Here, a text tag describes the document and a numerical tag displays the totals that T'n T calculated.

T'n T is not perfect, but if you want an organizational tool, it is a valuable program. People use it to plan all kinds of projects, sort huge data libraries on telecommunications systems, keep technical information handy, maintain budgets, and store BBS messages and prepare replies for uploading. Even if you use only a fraction of its vast capabilities, you'll be happy to have T'n T around.—Linda Joan Kaplan

See *Where to Buy* for contact information.

To Feed or Not to Feed?

Paper Plus 500

Automatic sheet feeder for LaserWriters.

Pros: Fast; holds 500 sheets. **Cons:** Installation requires opening up LaserWriter; ill-fitting bridge plate causes paper jams; only one paper bin. **Company:** The Laser Connection.

Requires: LaserWriter or LaserWriter Plus.

List price: \$995.

LaserFeeder

Automatic sheet feeder for LaserWriter

Plus. Pros: Software control and three bins let users select among several paper types.

Cons: Slow; incompatible with some programs.

Company: BDT Products. **Requires:** LaserWriter Plus. **List price:** \$1895.



If your LaserWriter churns out hundreds of pages a day, or is besieged by the demands of multiple users, each with different paper requirements, you may be in the market for a sheet feeder. These devices feed paper, transparencies, or envelopes through the LaserWriter's manual-feed slot, saving you the trouble of switching between letterhead and plain paper or frequently refilling the internal paper tray. We evaluated two LaserWriter sheet feeders, The Laser Connection's Paper Plus 500 and BDT Products' LaserFeeder. The two products offer different approaches to high-volume paper use, and each offers a unique set of pluses—and minuses.

Paper Plus 500

The Laser Connection's sheet feeder offers a hardware approach to printing productivity: you mount the feeder on the back of the LaserWriter and attach a clamp to one of the printer's cables. Installation entails opening the printer to attach the clamp, and you need a Phillips-head screwdriver and a pair of scissors or a pocket-knife to do so.

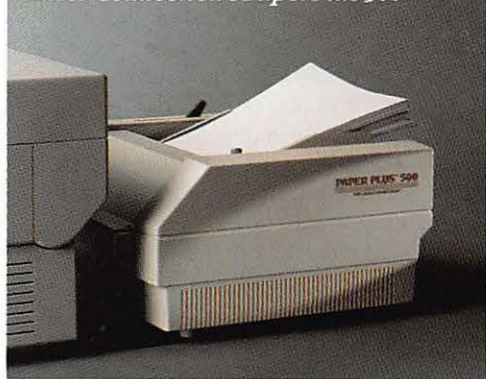
Once the feeder is installed, you simply specify Manual Feed in a program's Print dialog box, and Paper Plus takes over. As you may have guessed from the name, the feeder has a 500-sheet capacity.

Paper Plus 500 worked fine with the programs we tested. The only exceptions

were a few applications—MacPaint, FullPaint—that didn't support manual paper feed. (This is not the fault of the sheet feeder, but should be taken into account if you frequently print from programs that don't offer a manual-feed option.) We encountered occasional paper jams, probably caused by misalignment of the bridge plate, an aluminum plate that attaches the sheet feeder to the manual-feed slot. In fact, the plate frequently fell off altogether. (The Laser Connection is reportedly working to remedy this problem.)

Paper Plus operates almost as fast as the LaserWriter's internal tray, is relatively quiet, and takes up only about two feet of desk space (while the feeder itself extends more than a foot from the back of the printer, a space-saving vertical wire basket replaces the LaserWriter's horizontal output tray).

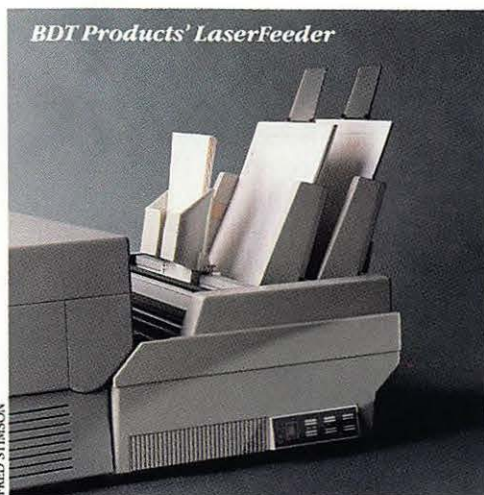
Laser Connection's PaperPlus 500



If The Laser Connection rectifies the bridge-plate problem, Paper Plus 500 could prove helpful for large printing jobs. It's of limited use in offices where employees frequently change paper types, however, since it has only one paper bin. To switch from 8½-by-11-inch sheets to envelopes, for example, you must remove the paper, re-adjust the tray, insert the envelopes, move the feeder forward, reset the printer, and change to envelope mode (by setting a switch at the back of the feeder). If you want simultaneous access to more than one type of paper, consider BDT's LaserFeeder.

LaserFeeder

BDT's sheet feeder is relatively easy to install—you attach the feeder to the LaserWriter's manual-feed slot, plug a cable into the printer's serial port, and plug the feeder into a wall socket. The installation instructions were generic rather than LaserWriter-specific, and they offered inapplicable information on switch settings.



Unlike Paper Plus 500, LaserFeeder is software-controlled. You install the LaserFeeder printer resource on all networked Macs that will be operating the sheet feeder. A LaserFeeder icon appears in the Chooser, and you select it if you want to use the sheet feeder instead of the LaserWriter's internal paper tray. LaserFeeder has two paper bins that hold about 200 sheets each and one bin that holds 50 envelopes, providing access to several paper types at once. With the software, you can even specify more than one bin per print job, printing the first page of a letter on company letterhead and the remainder on plain paper, for example.

LaserFeeder sounds good so far, but once we started printing, problems started cropping up. First, we came across software compatibility problems; LaserFeeder was incompatible with the latest versions of the LaserPrep (5.0) and LaserWriter (5.0) files. Worse yet, LaserFeeder didn't work with a number of programs, including XPress and Cricket Draw. (And like Paper Plus, LaserFeeder won't support programs that don't offer an option for manual feed; again, the sheet feeder is not to blame.) A BDT representative says the company is working to fix software compatibility problems.

We encountered no paper jams or alignment problems, but we found that printing from LaserFeeder was often *much* slower than from the LaserWriter's internal tray. For example, an 18-page WriteNow document that printed in 3 minutes and 21 seconds using the internal tray took 7 minutes and 34 seconds to print with LaserFeeder. Similarly, a 15-page MacWrite document took 3 minutes and 25 seconds with the internal tray, versus 6 minutes and 30

seconds with LaserFeeder. Printing speed varies from program to program, but such slowdowns negate the purpose of an automatic sheet feeder—to make printing more efficient. Finally, LaserFeeder takes up more desk space and is noisier than Paper Plus.

As you can see, each sheet feeder has its share of problems. The Paper Plus 500 is fast and quiet, but paper jams are common and only one paper bin is provided. The LaserFeeder offers flexibility in choosing paper types, but is often slow and doesn't work with some programs. Neither of the products are compatible with Apple's new LaserWriter II. These devices represent a major investment—\$995 for Paper Plus 500 and \$1895 for LaserFeeder. Although each manufacturer claims to be working on some of the problems we've mentioned, until they're fixed we can't recommend either of these products.—*Mark Hurlow and Erfert Nielson*

See *Where to Buy* for contact information.

States Its Purpose

American Discovery 2.0

Geography game. *Pros:* Intuitive; customizable; one or two can play. *Cons:* A bit dull; weak in some areas. **Company:** Great Wave Software. **List price:** \$69.95. **Requires:** 512K.



Quick—where's the Rio Grande? What state's official bird is the blue hen chicken? Answers to these and similar questions can be found in (and learned from) *American Discovery*, a geography game from Great Wave Software. If you already know all the state flowers and want to show off, or if your children are struggling with learning the states at school, this program will probably interest you. It's the only geography game for the Mac, and it's the only such game that allows customization.

American Discovery starts with Find the States. On a map of the United States, you click on the appropriate state or states (they're not labeled) in response to a question like "Which state is New York?" Each time you answer correctly, you're treated to Automatic Score Graphics, an animated

display of a horse race that—ironically—slows things down considerably. You can deselect this feature and play the game at a faster clip. The scoring system seems unnecessarily complicated, but it's easy to ignore.

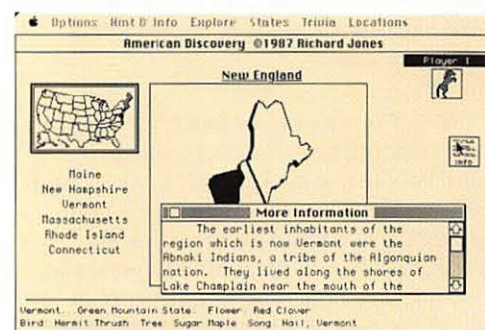
Once you've got the hang of it, you'll want to graduate to Click the States, Spell the States, Find the Capitals, and so on (the Rivers and Lakes section is particularly good). You answer questions in one of three ways: clicking on states or other buttons (cities, for example), typing in answers, or—for some games—clicking on states' two-letter abbreviations arranged alphabetically in a little box. This last method is not particularly intuitive; it helps if you already know that AK is Alaska, AR is Arkansas, AZ is Arizona, and so on (when the cursor is on an abbreviation, the full name of the state appears at the bottom of the box).

The Trivia portion of *American Discovery* offers 17 categories including Native Americans, Civil War, Parks and Monuments, Presidents, and Women. Some categories have only a few questions.

Custom Lessons

American Discovery's customization feature, *Discovery Maker*, enables teachers, or parents, to create interactive American geography and history lessons. Anyone can set up questions and answers as long as they fit the formats provided: Custom Trivia, Custom Locations, and Custom Explore. Entering question sets, adding hints, and so on, is simple and straightforward. It is this capability (as well as the inherent interactivity of the game form) that makes *American Discovery* different from a geography book: you can't customize a book.

American Discovery is a good educational game with a high degree of custom-



Exploring Vermont

From the Explore menu, you select a region; click on a state and then on the Info button, and a small window appears with historical and geographical information about the state.

izability and few flaws. The main flaw is that it's a bit bland and dull. Creative teachers, however, will undoubtedly be able to set up entertaining question-and-answer games within its shell. —*Felicity O'Meara*

See *Where to Buy* for contact information.

Clever Filing

AffiniFile 1.0

Desk accessory for filing text and graphics.

Pros: Powerful indexing and searching capabilities; ability to link files to applications. **Cons:** Long index entries not fully visible; can't scan quickly through graphics. **Company:** Affinity Microsystems. **List price:** \$79.95. **Requires:** 512K; 512KE recommended.



The need to access text and graphics from within applications led to the development of two of the original Macintosh desk accessories, Note Pad and Scrapbook. Easy to use but limited in functionality, they inspired a host of imitators with more capabilities and built-in search functions. A new DA, AffiniFile, in particular offers some clever new twists.

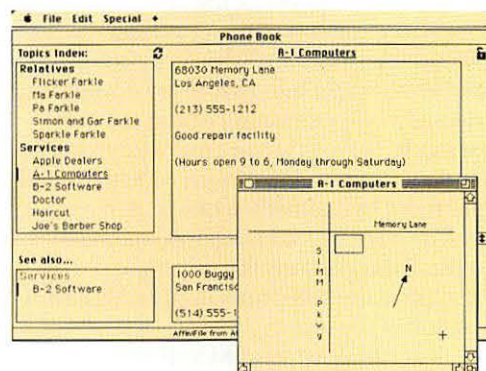
Indexed Cards

AffiniFile extends the familiar card file metaphor by adding indexing and cross-referencing functions. Every text passage or graphic in the file must have an entry in the index of topics and subtopics. (Topics and subtopics work identically except that deleting a topic also erases its subtopics.) A phone book file, for example, might have Friends, Relatives, and Services as topics, and the names of the people and businesses as subtopics (see "Today's Topics"). Clicking on any topic in the index brings up text notes in a scrollable window. AffiniFile saves notes in text-only format, but you can change the font and point size of the notes and index entries on the screen. Each topic or subtopic can have up to 32K of associated text. A minor gripe: since long topic names run past the edge of the index list, it would be handy to be able to resize the part of the window in which the index appears.

If you can't scroll quickly to the topic you're looking for, AffiniFile lets you

search through the index and notes for any text string. You can cross-reference related topics so that clicking on any one causes the others to appear in a separate list. Another convenient feature is the *alias link*, which lets you couple a single set of notes to as many topic names as you like.

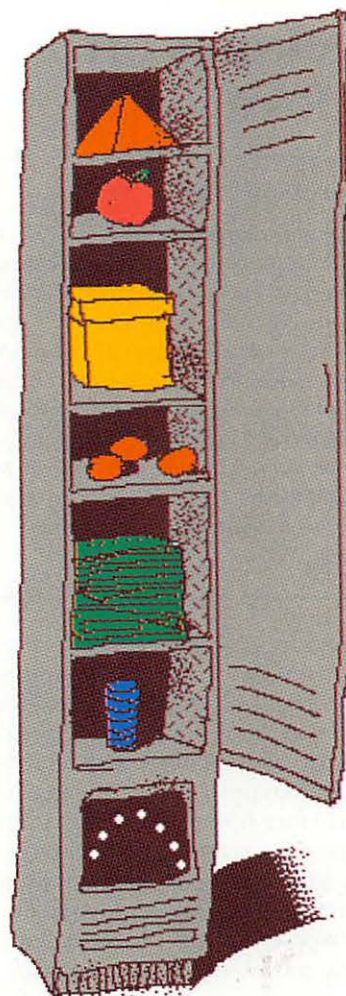
Importing graphics into AffiniFile is as easy as entering text notes. Double-clicking on any topic or subtopic brings up a separate window into which you can paste any picture that fits on the Clipboard. Topics with graphics attached to them appear underlined in the index. Unfortunately, there's no way to scan quickly through all the illustrations in a file or to view more than one graphic at a time. Still, AffiniFile's indexing capabilities should make it a good tool for storing clip art. [Note: Users who store just graphics should also consider Solutions' Curator program. See review in this issue.—Ed.]



Today's Topics

The top part of the AffiniFile window is devoted to the scrolling topic index and notes; cross-referenced topics and notes appear below. For quick comparisons, a click on the curved arrows above the index exchanges the current topic (and its notes) with the previously selected one. Graphics (like the map shown here) appear in their own window.

AffiniFile can save sets of topics, notes, and graphics in separate files, enabling you to create customized AffiniFile files for specific jobs instead of keeping all your data in one large file. You can configure a specific AffiniFile file to open automatically whenever you're in a particular application and you choose AffiniFile from the Apple menu—a good way to create custom help notes. In case you've already invested time typing text into a database or word processor, AffiniFile comes with an application for importing, exporting, or merging data.



The Bottom Line

It took me a while to appreciate AffiniFile's unique features enough to prefer it over similar DAs that don't include a built-in index. Now, however, I regularly use AffiniFile to keep track of everything from phone numbers to research articles. Although having to decide how to classify each new item is sometimes a nuisance, AffiniFile forces me to keep my information (and thoughts) neatly organized. Of course, AffiniFile doesn't pretend to offer all the functionality of a full-featured database. If you frequently need to access text or graphics in ways that AffiniFile can't handle, you should consider running a database application under MultiFinder. But for most people, AffiniFile will easily take care of many routine text and graphics filing needs. At \$79.95, it's an excellent value. —*Franklin Tessler*

See *Where to Buy* for contact information.

Envelopes on the Run

Kiwi Envelopes 1.05

Desk accessory envelope addresser. **Pros:** Positions addresses on envelope correctly each time; allows copying and pasting from other applications; offers full range of font sizes and styles; has customizable default file. **Cons:** No scroll bars; doesn't display actual font size and style; no undo feature. **Company:** Kiwi Software. **List price:** \$5 plus initialized disk if purchased from manufacturer; free from CompuServe (GO MACPRO, DA, envelope) and other online services. **Requires:** 512KE. **Copy protection:** None.



Addressing an envelope using a word processor and the ImageWriter or LaserWriter is awkward at best. If you've ever attempted it, you've probably discovered why many secretarial stations have typewriters sitting next to the Mac. No matter how carefully you estimate where to position the mailing and return addresses on the screen, the type usually ends up too high or too low on the envelope; or worse, it prints on the platen, smudging and possibly damaging the rubber.

A new desk accessory, Kiwi Envelopes, offers a foolproof, quick, and easy way to address an envelope. The program provides a window outfitted with address entry boxes. You simply type in the return and mailing addresses, select font size and style, choose letter or legal size, load an envelope in the printer, and click on Print. The DA automatically positions the addresses in the correct locations on the envelope.

The only alternatives to Kiwi Envelopes are mail merge programs such as Bulk Mailer from Satori or Client/Mac from Software Complement. These programs are good for addressing a large number of mailing labels or continuous-form envelopes. But Kiwi Envelopes has the advantage of being available from within any application or at the desktop; and it is a lot easier to set up, which makes it practical for addressing just a few envelopes.

Of Printers and Paper

You can use Kiwi Envelopes with the ImageWriter, ImageWriter II, LaserWriter, and LaserWriter Plus. (The documentation claims that the program should work with all Macintosh-compatible printers.) Of the Apple printers I tried, the ImageWriter II worked best with Kiwi Envelopes. You place the envelope behind the platen, align the left edge with the alignment icon, press the form feed button, and the envelope advances to the correct starting position. The older ImageWriter takes a bit more manual activity since you have to feed the envelope through to its starting point by hand. The LaserWriter is the most awkward to use—you must push the envelope forward with just the right pressure so that the rollers grab it properly. The first few times I tried this the machine jammed, but eventually I got the knack.

While the ImageWriter II has the most automated envelope feed, it does result in the return address being about 1 inch down from the top of the envelope—a bit lower than is normal. Since prior to using Kiwi Envelopes I handwrote my envelopes, this slight off-positioning doesn't bother me much. But if you can't live with that minor flaw, use envelopes with wide flaps and feed them in manually with the flap extended until the fold is against the metal guide. This positions the envelope so that the return address prints in the standard position at the top.

You can download Kiwi Envelopes "for free" from many online services such as CompuServe, GENie, or EduComp. Downloading files, however, gets expensive if you have to try it multiple times because of communication glitches. A better method is to purchase the program from

Kiwi. You get only a skimpy four pages of documentation, but it offers some helpful tips. For instance, the documentation explains how to create a default file containing a return address and preferred font size and style for both the mailing and return addresses.

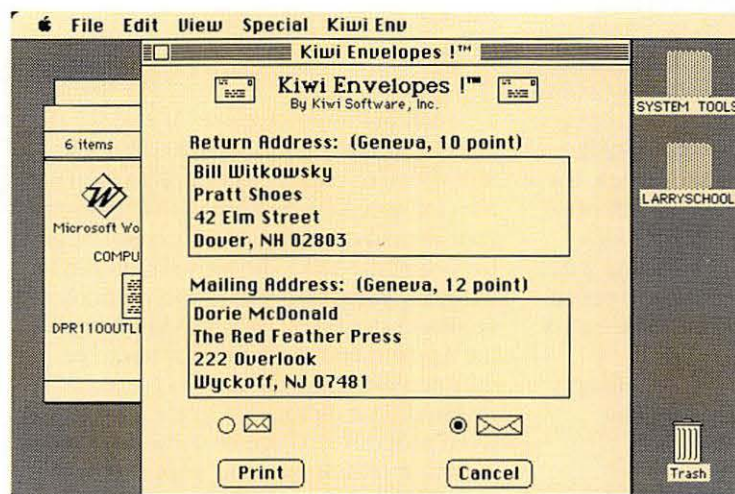
Kiwi Envelopes has a small job to do, but it does that job well by providing a number of time-saving features. For example, when you click on Cancel, the program automatically saves any data in the address entry boxes; that information reappears next time you open the DA. So if you address an envelope and have to wait to use the printer, you can go to another application and still get your address back at any time. Another nice feature is the ability to copy and paste an address from most other programs.

I hate to look a gift horse in the mouth, but there are a few problems with this DA. While you can input any number of lines in the address boxes, the screen shows only four lines, and there is no scroll bar. You can scroll around by selecting (highlighting) upwards or downwards, but then there is the danger of losing data if you press any key. On an extended keyboard, you can also scroll by using the up and down arrow keys. And, while Kiwi Envelopes does cut, copy, and paste, it doesn't undo. Another problem is that the screen doesn't display the font size and style to be printed.

Kiwi Envelopes won't replace any mail merge programs. But for addressing just a few envelopes at a time, it definitely beats swiveling over to the typewriter.

—Laurence Stevens

See *Where to Buy* for contact information.



Please Mr. Postman
You either type or paste addresses into Kiwi Envelopes' formatted boxes. The font style and size is described above each box, but the type in the boxes does not change to reflect the style. By choosing letter or legal size you set up the printer without accessing the normal page setup dialog box.

Organization for Art's Sake

The Curator 1.02

Art cataloging system. **Pros:** Reads several file formats; displays keyword list. **Cons:** Drawings cannot be edited from within The Curator. **Company:** Solutions International. **List price:** Version 1.04 \$139.95. **Requires:** 512K, two drives (at least one drive should be 800K); hard disk recommended.

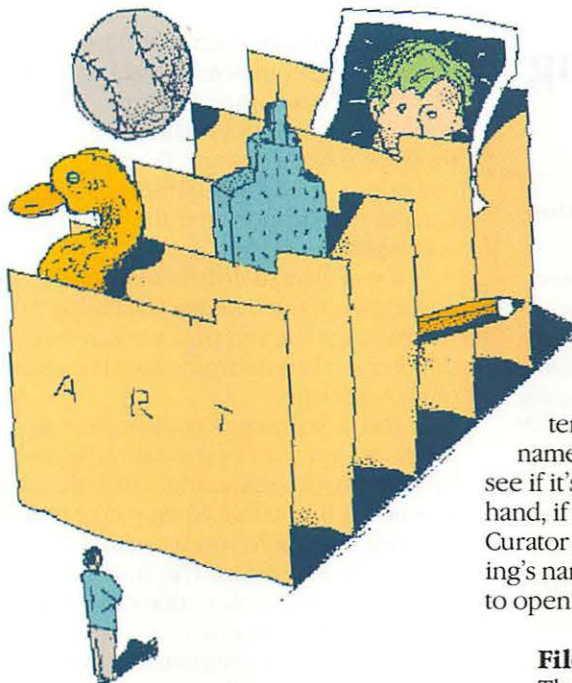


If you're like many desktop publishers, organizing your growing clip-art collection is becoming a task akin to keeping track of the entire contents of the National Gallery of Art. And just as the curator of a real-world gallery must contend with artwork of different styles and periods, so the Mac art collector must deal with numerous file formats: MacPaint, Encapsulated PostScript (EPS), and PICT, to name just a few. Fortunately for those who own sizable libraries of digital artwork, Solutions International has released an art-management program called The Curator.

Available as either a desk accessory or a stand-alone application, The Curator is versatile enough to suit a variety of work habits and organizational schemes—recognizing MacPaint, PICT, EPS, TIFF, PostScript, Solutions' Glue, and IBM's EPS file formats. (Although The Curator can't read files saved in program formats such as SuperPaint or Canvas, most programs offer several Save As options.) Finally, The Curator offers a number of ways to search for artwork: by name, keyword, thumbnail sketch, or even file type.

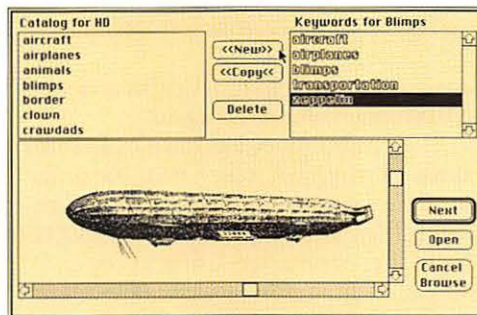
The Curator at Work

Suppose you need a picture of a hot-air balloon for a newsletter. You have hundreds of images on your hard disk, both commercial clip art and pictures you've created in programs such as Illustrator, Cricket Draw, and SuperPaint. The images are stored in several folders—alas, in somewhat haphazard order. If you're pretty sure you know which folder contains the picture of the balloon, your best bet is to use The Curator's Select By Name option, which displays the names of all the drawings in one folder. If you have no idea where the drawing might be, select the



Search By Name function and enter the word *balloon*. The Curator searches selected folders until it finds a title containing the word *balloon*. Fortunately, you can stop a search as soon as you find the image you need.

Unfortunately, you can't always remember a drawing's title—or even part of it. To make the best use of The Curator, you'll have to do some preliminary work in the form of adding keywords. The program lets you add keywords to each drawing, so that you can later search by keyword instead of stabbing at titles (see "Just Browsing"). The Curator automatically creates an alphabetical list of keywords as you add them. Referring to the keyword catalog as you search alleviates the problem of forgetting not only a drawing's title, but what keywords you assigned to it.



Just Browsing

The Curator's Browse option lets you scan the drawings in a folder or floppy disk, adding as many keywords as you'd like to each picture to facilitate later searches.

The program also lets you select a drawing by displaying a folder's contents in the form of postage-stamp-size "thumbnail sketches," but I found this method of little use since at this reduced size many drawings resemble an insect that has encountered a windshield at high speed. To be fair, the thumbnail sketch also displays a drawing's title, although the title is reduced to 12 characters. If you tend to give your drawings long names, you'll need to open a drawing to see if it's the one you want. On the other hand, if you look at the information The Curator provides when you select a drawing's name or thumbnail, you may not need to open it.

File Formats

The Curator tells you the drawing's format (PICT, TIFF, PNTG, and the like), its creation date, last date changed, and a code name for the program in which it was drawn (MPNT, MDRW, for example). A secret decoder ring for these abbreviations would be a welcome addition (ARTY = Illustrator, for example).

The Curator not only recognizes numerous file formats but can often change one format to another. This could prove handy if you wish to place a drawing into an application that doesn't accept the drawing's current format. While this capability is a thoughtful bonus, keep in mind that changing file formats is tricky stuff; information can be lost or altered when being changed from one format to another. (For an explanation of Macintosh graphics file formats, see "Smooth Moves," *Macworld*, February 1988.)

Because of its versatile selection methods and ability to recognize numerous file formats, I prefer The Curator to the other Mac art-management systems. Although it lacks PictureBase's ability to scale drawings before pasting them, The Curator wins points by displaying its keyword list. And while I like Graphindex's picture-editing capabilities (flip, rotate, invert, and edit pixel-by-pixel), that program is hindered by a somewhat cumbersome setup procedure. So if your art collection is getting too big to handle, you just might want to hire The Curator.—*Erfert Nielson*

See *Where to Buy* for contact information.

AI Programming on the Mac

LPA MacProlog 2.0 Wizard Edition

Prolog compiler and development environment for artificial-intelligence applications. **Pros:** Provides ready access to Toolbox through Prolog functions, reducing need for programmer to understand Macintosh internals. **Cons:** Manual is difficult to read and inappropriate for casual programmers; proliferation of windows during normal use is distracting. **Company:** Logic Programming Associates. **List price:** \$495. **Requires:** 1MB; two floppy drives or a hard disk recommended.



Ever since Japan's 1981 decision to base the software portion of its Fifth Generation AI project on Prolog, that once obscure language has become quite popular. For researchers and developers involved in AI on the Macintosh, MacProlog 2.0 is worth investigating.

An Enhanced Standard

MacProlog 2.0 Wizard Edition is a complete development environment for dedicated Prolog programmers. From the manuals, to the programming aids, to the price, this is not a package for someone with only casual interest in the language. For \$495, you get an interpreter, two compilers, a number of specialized programming tools, and over 400 pages of documentation.

MacProlog 2.0 is an extension of the widely accepted dialect of Prolog called the Edinburgh syntax. This syntax makes it relatively easy to develop programs on the Macintosh, then port them to other compilers running on high-performance AI machines.

The major enhancement that MacProlog 2.0 provides over a standard compiler is a set of Macintosh Toolbox functions that fit easily into the Prolog view of the world. A Prolog programmer doesn't have to know anything about the internal workings of the Macintosh to write programs that work with windows, menus and dialogs, or serial port I/O.

Program Development Aids

In addition to the traditional interpreter, MacProlog 2.0 provides two compilers. The incremental compiler compiles new

clauses as they are created, continually adding to the completed object code. This helps reduce programming time, since the entire program is not recompiled each time you make a change. The optimizing compiler is used for generating a fast, compact application after the program is complete.

If you want to distribute a stand-alone application written under MacProlog 2.0, you must get the run-time version and a distribution license from Logic Programming Associates.

The development environment also provides a number of specialized tools to help during programming. The Balance function is invaluable when you're trying to figure out where you are within a mass of nested parentheses. The Tracing facility helps monitor the execution of your program. And the Call-graph facility displays any clause in your program as a tree, showing the hierarchy of function calls (see "The Structure of Logic").

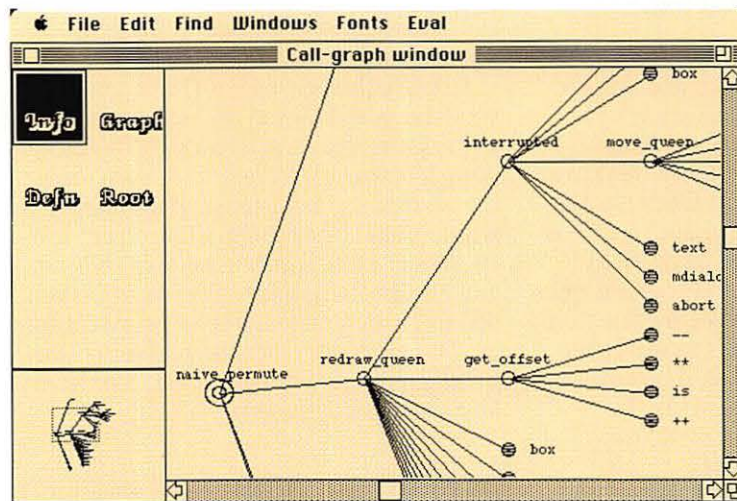
The Help facility, however, is disappointing. If Help is activated, and you select a command from a menu, you get only a description of that command. You then

ules. In addition, MacProlog 2.0 uses two standard output windows—one for text, and one for graphics. And since each of its programming aids also uses a window, a large monitor is recommended.

Research and Development

Compared to other Prologs available on the Macintosh, LPA MacProlog 2.0 provides the best high-level Toolbox access. However, you pay for this with a more complex programming environment. AAI Prolog, by Advanced AI Systems, for example, is easier to use for most straightforward logic programming. As far as execution speed is concerned, MacProlog 2.0 falls near the midpoint between AAI Prolog and the slower Personal Prolog, by Optimized Systems Software. However, you can increase MacProlog's execution speed by using the program's optimizing compiler.

MacProlog 2.0 Wizard Edition is a good Prolog development environment for AI researchers and developers of AI-based software. It provides a variety of powerful programming tools, as well as access to the Macintosh Toolbox at a high level. The documentation, though difficult to read be-



The Structure of Logic

This Call-graph shows an explosion of the calling structure of a function from an example program. The tiny picture in the lower left is an overview of the complete function.

must disable the Help function in order to use the menu commands again.

The programmer interface makes liberal use of windows, which helps organize a program, but the screen can become impossibly busy very quickly. This is especially true for programmers using a proper, modular programming style where different windows display different code mod-

cause of its awkward layout and small type-size, is nonetheless complete. If you're not intimate with the language to begin with, however, the whole thing can be frightfully intimidating. The presentation and price make this package less desirable for casual or non-Prolog-literate programmers. But a smaller, less expensive Student Edition is also available.—Ken Takara

See *Where to Buy* for contact information.

Form Wars

TrueForm

Forms processing software. **Pros:** Intuitive; works with existing forms; accepts TIFF and PICT files. **Cons:** Can't import data from other sources; lacks search and sort features; won't let you print one page in a document; expensive.

Company: Spectrum Digital Systems. **List price:** \$495; TrueForm Fill-Out (run-time version) \$150. **Requires:** 512KE.

Fast Forms 1.1

Forms processing software. **Pros:** Intuitive; inexpensive; good drawing tools for creating forms; fill-out part of program works as desk accessory; good export features. **Cons:** Can't import data from other sources; lacks search and sort features; can't save completed forms; calculation is slow. **Company:** Shana Enterprises. **List price:** \$149. **Requires:** 512K.



Two software packages, TrueForm and Fast Forms, claim to eliminate much of the repetitiveness in filling out forms with a typewriter. The programs place information in the correct spaces on forms and offer such handy features as automatic date- and time-stamping and the ability to perform calculations. But don't throw that typewriter out yet—these programs may not solve all your forms processing problems. TrueForm, for instance, does not provide drawing tools for creating forms; Fast Forms does not let you save completed forms. Neither program lets you import data, so any information stored in a database or spreadsheet must be retyped.

The Truth about TrueForm

Because TrueForm lacks drawing tools, you must either scan in an existing form or create a form in another package and save it in TIFF or PICT format. Unfortunately, because scanned images are hard to keep straight, you should use them only as templates (see "Crooked Lines"). After you create the form, you use TrueForm's Set-Up module to create fields (places where users will enter information on the form) by highlighting the appropriate areas. You can specify fields as numeric, text, date, or check box. After creating a field, you can rename it, change the font,



create a formula, or assign a constant. You can also group fields of the same type.

Once you have defined the fields, you use TrueForm's Fill-Out module to complete individual forms. One particularly handy feature is TrueForm's information window, which you create in Set-Up. When you complete the form with Fill-Out, the window automatically appears with details on how to fill in each field (see "Info Window"). This is especially useful for entries such as hard-to-remember codes.

TrueForm saves filled-out documents in stacks, which are similar to database files but lack search and sort capabilities. Although TrueForm lets you export these files in text format to a database for sorting, you can't specify tab or comma delineation. The program saves files with carriage returns after each field.

You can print information onto pre-existing forms, or you can print both the form and the information on blank paper.

TrueForm works with LaserWriter and ImageWriter printers and compatibles. Printer alignment controls are included so you can set up the spacing to match newly created forms. Spectrum, which sells a compatible Canon IX-12 scanner, also supports several other scanners—including those from Abaton, Microtek, and New Image Technology.

TrueForm's documentation contains all the information you need, but it is hard to find since the index has serious omissions. Luckily, this probably won't cause major learning problems—the manual is well illustrated and the program is very intuitive.

TrueForm has a few bugs. The sequential numbering feature behaves erratically, starting the numbering over whenever you reopen an existing stack to enter a new form. The major problem, which almost ruins TrueForm, is that forms compiled in stacks cannot be printed one at a time—you must print the entire stack.

Computer consultants are potentially a large market for TrueForm. Because the layout and entry programs are separate, a consultant can use Set-Up to design standard forms for a company and then sell the company TrueForm Fill-Out separately. In addition, a consultant may be better able to justify the purchase of a scanner—average business users may find that buying a scanner for the sole purpose of digitizing forms is a waste of money.

Is Fast Forms Faster?

Originally sold as Fast Forms Construction Kit from New Directions Software, Fast Forms is now in the hands of its original developers, Shana Enterprises. Except for the addition of a more readable and better-looking manual, the program

DATE	ACTIVITY	HOURS

Crooked Lines

Alignment is always a problem for sheet-fed scanners, and Spectrum Digital's scanner is no exception. It is almost impossible to get lines perfectly straight. Scanned images should be used only as templates to position fields on existing forms.

Info Window

TrueForm's information windows are created in TrueForm Set-Up and appear in TrueForm Fill-Out. Because the cursor is in the Shipping box, a window with shipping information appears at the top of the screen.

remains basically the same. Like TrueForm, Fast Forms consists of two programs: one for designing forms and one for filling them out. The fill-out part of Fast Forms is a desk accessory—particularly handy if you plan to use the program with an existing spreadsheet or database.

Unlike TrueForm, Fast Forms includes drawing tools for form design. Anyone familiar with MacDraw will have no trouble mastering these tools (see "Drawing Tools"). Each form has two drawing planes, one visible and one invisible. You use the invisible plane for tracing objects or for working with preprinted forms. Artwork on the invisible plane does not print.

After drawing a form, you add fields and identify each one as text, numeric, or calculated. You can further define fields as dates, monetary values, or check boxes. Field calculations are limited to addition, subtraction, multiplication, and division, and you're required to enter field names for calculation by typing (unlike Trueform's

point-and-click procedure). People accustomed to Excel will find Fast Forms' calculation painfully slow.

Once a form is filled out, there is no way to save it. All information must be exported to a text file. Whereas TrueForm forces you to export data in return-delineated format, Fast Forms lets you choose between return-, comma-, or tab-delineated format.

As a forms design program, Fast Forms is remarkably good. Screen tints and rounded corners can be adjusted in 1 percent increments. A hairline is included for printing forms on a laser printer. If you want a program strictly for designing forms and don't plan to depend heavily on interactive form processing capabilities, Fast Forms rivals the best drawing programs.

And the Winner Isn't...

Neither TrueForm nor Fast Forms is everything it should be. Both are easy to set up and use, but the absence of data import and search and sort functions limits the programs' usefulness. TrueForm has better calculation features, but at nearly \$500, it is no bargain. (In part, the price difference is reflected in the two companies' support policies. Spectrum offers unlimited toll-free support and free bug-fixes to registered users; Shana Enterprises offers a 90-day warranty, and tech support that's contingent upon your telephone budget.)

TrueForm is the better choice if you need to fill out existing forms. But if you need to design forms, or if you are on a budget, try Fast Forms. Although not quite as easy to use as TrueForm, Fast Forms has 90 percent of that program's functionality at a lower price. —Jim Morton

See *Where to Buy* for contact information.

Drawing Tools

Fast Forms offers a complete selection of drawing tools, which appear in a second-level menu bar inside the active window. Users familiar with MacDraw will have no problem learning to use these tools.

Taking Command of Works

WorksPlus Command 1.0

Macro program for Microsoft Works.

Pros: Automatically records macros; provides complete macro language; very fast macro execution; good documentation. **Cons:** Needs almost 250K disk space. **Company:** Lundeen & Associates. **List price:** Version 1.1 \$99.95.

Requires: 1MB.

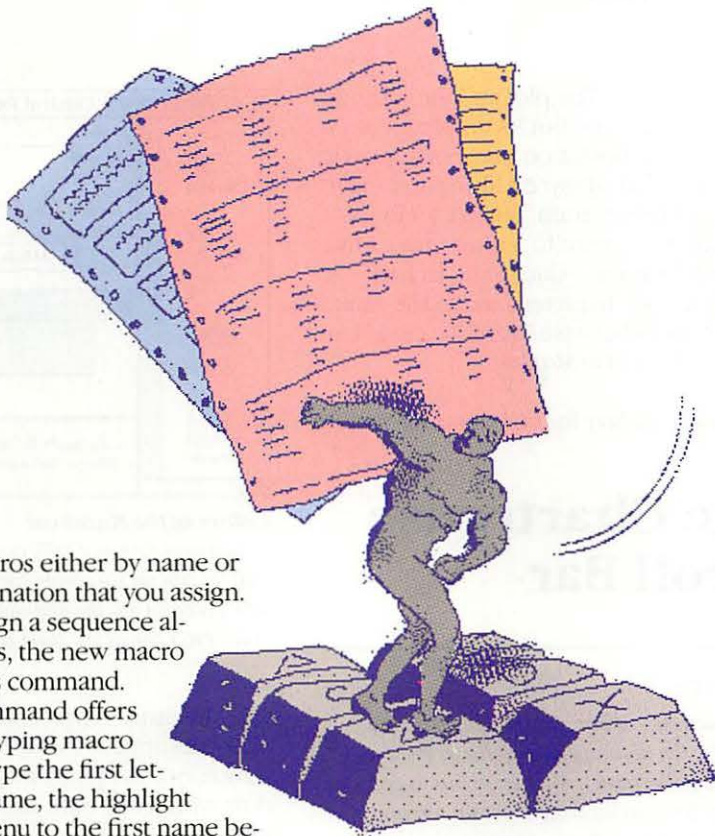


WorksPlus Command, a macro facility for Microsoft Works, lets you add features like the macro capability found in Excel and the \mathbb{H} -key shortcuts of Word. The program requires very little memory—until you use a macro. Even then, only the memory required for that macro is consumed. Once a macro is loaded into memory, execution is quite fast—thanks, in part, to a compiler that turns the text version of the macro into executable code. The compiler, however, requires approximately 230K of disk space—so using the program plus a few basic macros on a 400K-drive system will be tricky.

You can use WorksPlus Command on three levels: to run the macros provided with the program, to create your own macros using the recorder function, or to write your own using Command's macro language. The program comes with 30 macros. For example, there are macros that enable you to generate multicolumn labels and reports from a database, prepare a table of contents and an index for multiple word-processing documents, define and use style rules, and perform global search-and-replace in database and spreadsheet documents.

Making Your Own Macros

The easiest way to create a macro for a particular procedure is simply to select the Record Macro function, then work your way through the procedure. The program records your actions; you can edit this record later. For instance, suppose you have created a macro that calls a local BBS, correctly answers all the prompts to log you on and read your mail, and downloads any programs that have been added since your last call. By using the WorksPlus macro language, you can edit your macro so that it branches to different routines depending on the prompts received from the BBS.



You access macros either by name or by any \mathbb{W} -key combination that you assign. However, if you assign a sequence already used by Works, the new macro overrides the Works command.

WorksPlus Command offers a nice shortcut for typing macro names. When you type the first letter of the macro's name, the highlight moves down the menu to the first name beginning with that letter. When you type the second character, the highlight moves to the first name beginning with those two

```
{ Check for SS/DB document
GetDocInfo( Names, Types, WindowNumbers, MainDoc, Size )
if Types[1] = "WP"
return 0 { not SS/DB

GetSelection( Selection )
Top = Selection[TopInfo]
if And( Top = 0, Left = 0 )
halt { no selection
if Top = 0
Top = 1
Left = Selection[LeftInfo]
if Left = 0
Left = 1
Bottom = Selection[BottomInfo]
Right = Selection[RightInfo]
return 1 { found SS/DB
end
```

Complex Code

WorksPlus Command's macro language lets you create subroutines. The first one listed here is used in the Dial Phone macro to ensure that a word processing document is active. The second, more complex subroutine is used by several macros to define a selected area in a document. It shows the use of array variables.

characters, and so on. That way, you don't need to type the full macro name. When the macro you want is highlighted, simply press Return, and WorksPlus Command runs the macro.

WorksPlus Command also provides a language that enables you to program com-

plicated macros and edit supplied or recorded ones. For example, you can have a macro create documents that vary in content according to calculations performed in other documents. The macro language is not easy to learn (see "Complex Code"), but a debugger and a dialog editor let you incorporate many of the features of the Mac's user interface within your macros. The program provides a lot of power, and the time you invest will be paid back in full with the increased productivity you get from Works.

Powerful Enhancement

WorksPlus Command's manual provides a thorough tutorial on using the supplied macros. The macro language is well documented, with many useful illustrations. Although complicated macros are not included in the manual, you can open, study, and change any macro that is supplied on the disk.

WorksPlus Command is a powerful enhancement for Microsoft Works. Using the supplied macros and defining your own will increase the flexibility and productivity of your work. The macros execute quickly, yet require very little overhead in RAM. Overall, WorksPlus Command is more than a good investment; it is a significant tool.—Kenn Chapman

See *Where to Buy* for contact information.

Backstabbing 1A

Trust and Betrayal: The Legacy of Siboot 1.05

Strategy and personality-manipulation game. **Pros:** Imaginative theme and execution. **Cons:** Can get a little tedious over the course of a long game; sometimes difficult to assess the reactions of "artificial personalities."

Company: Mindscape. **List price:** \$49.95.

Requires: 512K; 800K drive. **Copy protection:** Not copyable (one-time installation available for hard disk).



Trust and Betrayal: The Legacy of Siboot is an inventive and unconventional strategy game from Mindscape that pits you against six computer-controlled artificial personalities. The goal is to become Shepherd of Kira (a barren moon of Lamina, and spiritual center of the Laminan civilization). The battles are mental and are waged while the players sleep, but the real strategic maneuvering takes place during the day, when you must play a combination detective, psychologist, and diplomat in order to gain advantage in the nightly struggle.

Auras Are an Alien's Best Friend

As one of seven acolytes, you have attained a certain proficiency in your studies and have almost gained the required number of auras needed to become Shepherd. Auras confer greater telepathic powers on the owner. There are three types of auras—*tanaga*, fear, *katsin*, trust, and *shial*, love—and the first acolyte to gain eight of each becomes Shepherd.

In a spiritual paper, rock, and scissors game, *tanaga* defeats *katsin*, *katsin* defeats *shial*, and *shial* defeats *tanaga*. So knowing how many of each aura the other players have (their *aura count*) is an important aspect of the game. Armed with that knowledge, you can predict the other players' moves in the nightly battle. When you defeat another player, you gain the aura he or she used against you.

You communicate with other players via a special icon-based language called *eeyal*. Although not capable of expressing complex thoughts or ideas, this language is adequate for playing the game and enables you to convey emotional as well as factual information.

The central theme of *Trust and Betrayal* is one of personality manipulation. To gain the information you need, you must manipulate the other players by flattery or threats or by revealing useful information to them. At the higher levels of the game, characters exhibit greater variety in their responses and play the game with more subtlety. Without the information that the other players possess, you can't win the game. Sometimes, to persuade players to be on your side, you will promise not to betray them by revealing any of their aura counts, or you'll promise not to attack them that night.

Betrayal may not be good, but it is a fact of life in this game. Aura counts are revealed in exchanges, with two betrayals in each exchange (see "Double Betrayal"). Sometimes you can offset the negative effects of betraying a character by accusing that character of betraying you (based on information learned from some other character). This pattern of betrayal, accusation, and information barter repeats throughout the game.

A Disagreeable Personality

I liked the detective aspect of the game; my favorite part was the nightly decision—who to attack, and with which aura. I frequently found myself pondering my options and developing strategies several moves ahead. But after a while, the constant dialogues with the other players became repetitious. Although the game remains challenging, I found eeyal too limiting, and the artificial personalities too artificial, to keep me coming back.

Trust and Betrayal is clever and original. It's based on intriguing concepts of strategy and personality interaction (read

manipulation). The plot and the programming are excellent, but its emphasis on betrayal and manipulation may not appeal to everyone. I found myself liking and even admiring the program, but not feeling compelled to return to it after four or five successful games—due to the lack of growth in the characters and to the limitations of the otherwise inventive eeyal language.—*Rusel De Maria*

See *Where to Buy* for contact information.

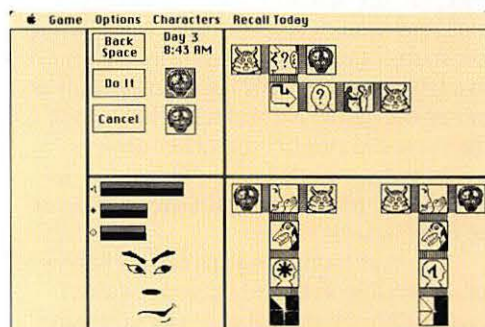
The Chartreuse Scroll Bar

Colorizer 1.12

Color utility. **Pros:** Saves named sets of colors for the desktop; adds color to PICT files; captures color screen images; prints to color printers; lets you set color start-up screen; excellent manual. **Cons:** Start-up screens lose pattern detail; prints slowly; some color images printed on black-and-white printers are hard to decipher; many unattractive default color schemes. **Company:** Palomar Software. **List price:** \$49.95. **Requires:** 1MB, Mac II, and color monitor.

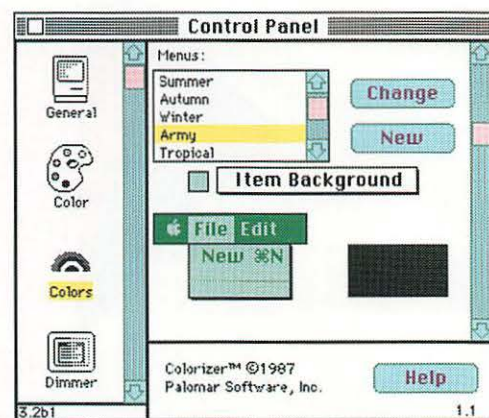
Capture

Screen capture program. **Pros:** Captures all or part of a screen image; works with color or black-and-white monitors of any size; saves images as PICT files or in Clipboard; short, clear manual. **Cons:** Expensive. **Company:** Mainstay. **List price:** \$59.95. **Requires:** 128K.



Double Betrayal

The eeyal language: a double betrayal is taking place. Notice the bar graphs in the lower-left corner. These display your opponent's fear of, trust in, and love for your character.



Colors of the Rainbow

Colorizer's Colors CDEV contains five subpanels that let you set up colors for items on the desktop, select a color for the highlight bar, and define a color PICT file as the start-up screen.

top. Miniature representations of desktop elements appear in subpanels. For instance, one subpanel displays a tiny window with scroll bars and a button. Colors includes a list of 39 predefined color schemes from which to choose. When you select one, the miniature window changes to reflect your choice.

Many of the predefined schemes, however, include illegible menus and unattractive color combinations. Fortunately, you can easily modify any part of a predefined color scheme or create and save your own schemes. You can also use Colors to set up a color PICT file as the start-up screen. But be careful what you choose—in order to keep peace with the System software, the program removes all pen patterns from a start-up screen graphic. As a result, I lost much of the detail in my chosen picture.

A MacDraw-like application, Colorizer (the second program in the Colorizer package) lets you color the foreground and background of each object in a PICT file. Simply click on a part or group of parts in the drawing and then choose a color from the foreground or background color menu or from the Apple-supplied Color Picker wheel. Each color menu contains 13 basic colors; you can modify or delete them, or add other colors.

The third program in the package, Color SaveScreen, provides the standard Mac screen-snapshot capabilities, plus the ability to save color images. Unfortunately, like ⌘-Shift-3 , Color SaveScreen (⌘-Shift-4) still does not allow you to include pulled-down menus.

Color PrintScreen, the fourth Colorizer program, prints the screen as a color image to a color printer, such as the Image-



The recent addition of color to the Macintosh world will undoubtedly result in some garish color combinations. Colorizer is a tool to help you create them. A package of four programs, Colorizer lets you set up colors for your desktop, add color to PICT files, capture color screen images, and print to a color printer. Several other programs, such as Capture from Mainstay and a shareware program called Kolor, provide some of Colorizer's functionality.

Colorizer's first program, Colors, is a Control Panel device (CDEV) that enables you to set colors for any part of the desk-

Writer II, or as a black-and-white image to the LaserWriter. But be forewarned—any color picture printed on a black-and-white printer will appear as it would on a black-and-white screen. For instance, a digitized picture printed on a LaserWriter Plus was very hard to decipher. A printout of the desktop with colored icons and windows, however, was clear. The manual warns you that on a color printer such as the ImageWriter II, the colors may differ from those on the screen.

Although Colorizer is intuitively easy to use, you'll want to read the manual for its enlightening explanations of the technical aspects of color. For instance, the manual explains how to use Apple's Color Picker, provides a table with numerical values for six pure hues, and includes gray-scale color equivalents. Palomar's telephone support line is not toll-free, but when I called during a weekday afternoon, I received prompt and friendly advice.

Capture

Capture, from Mainstay, provides features similar to Colorizer's Color Save-Screen. Capture enables you to save color or black-and-white screen images into either the Clipboard or a PICT file. The program works on any Mac screen. In addition, Capture lets you take snapshots of pull-down menus and dialog boxes.

Capture's ability to save a portion of a screen image is another really helpful, step-saving feature. You simply drag a cross-hair cursor across the screen *before* you save the image. To get the same effect with Colorizer's Color SaveScreen, you must save the entire image, import it into Colorizer, and edit it.

If you need only one of Colorizer's features you may be better off with a specialized product such as Capture. Other options include Kolor, a shareware program, which provides many of Colors' functions. Color, an Apple CDEV, allows you to choose a color for the screen highlight.

But Colorizer is a useful, robust product that provides a number of valuable color capabilities. I particularly like being able to save sets of colors. Not only does this feature make it easy to keep track of interesting color combinations, but it also offers you an easy way to switch to a new color scheme when you get bored with the old one. —Jack Hodgson

See *Where to Buy* for contact information.

Backup Blues

Apple Tape Backup 40SC

40MB tape backup unit. **Pros:** Fits under Plus and SE; software performs mirror, file-by-file, and incremental backups; uses standard tape cartridges. **Cons:** SCSI address hard to change; cables and terminators not included; limited software; will not back up a mounted AppleShare volume. **Company:** Apple Computer. **List price:** \$1499.

HyperTape

40MB tape backup unit. **Pros:** Solidly built; SCSI address easily changed; includes cable and terminator; software performs mirror, file-by-file, and incremental backups; backs up a mounted AppleShare volume; uses standard tape cartridges. **Cons:** SCSI address located on back; software has bugs. **Company:** General Computer Corporation. **List price:** \$1399.

Data File 40

40MB tape backup unit. **Pros:** SCSI address on front; comes with cable; most flexible backup software; can read tapes created by other drives; uses standard tape cartridges. **Cons:** Requires screwdriver to change SCSI address; does not include terminator; slowest backup software. **Company:** NuData. **List price:** \$1299.



Backing up a hard disk can be a lot of trouble—unless you enjoy sitting at the Mac, feeding it disk after disk. Using a tape backup unit, however, makes file archiving an easy, one-step procedure. This review compares three tape backup units—Apple's Tape Backup 40SC, General Computer Corporation's (GCC) HyperTape, and NuData's Data File 40.

The Hardware Heart

Since all three units use 3M's 40-megabyte DC 2000 tape cartridge, their primary physical differences lie in their size and in the location and styling of the SCSI address dial. The Data File is by far the smallest of the units. The HyperTape comes in the same basic side-standing case as GCC's external HyperDrive hard disks, and its design makes it easy to carry. The Apple backup fits underneath any of the smaller Macs.

The Data File's SCSI address dial is on the front of the unit but you need a small screwdriver to change the address. The dial on both the Apple and HyperTape units is located in the back; the HyperTape's address can be changed with a finger while the Apple requires that you use a paper clip. If the ability to change an address easily seems unimportant, just try to adjust an Apple unit that's attached to two or three disks on an AppleShare server without taking everything apart.

Although all tape backups normally require terminators, not all units supply them, nor do all come with the proper cabling. The HyperTape is equipped with a Mac-to-SCSI cable and terminator. The Data File comes with either a Mac-to-SCSI or a SCSI-to-SCSI cable, but you have to fork over an additional \$24.95 (list price) for the required terminator. The Apple unit includes neither cables nor a terminator, so get out your checkbook.

If you buy them from the tape backup manufacturers, cartridges cost \$40 to \$50 each. The wide price range seems a bit strange since all three companies supply the identical 3M cartridge. Also, the tapes are labeled as being 40MB, but the actual capacity when formatted is around 38.5MB. This usually isn't a problem, however, since



General Computer's HyperTape, NuData's Data File 40, and the Apple Tape Backup 40SC—although they make a good effort, not one of the units was completely problem-free.

FRED STIMSON

Reviews

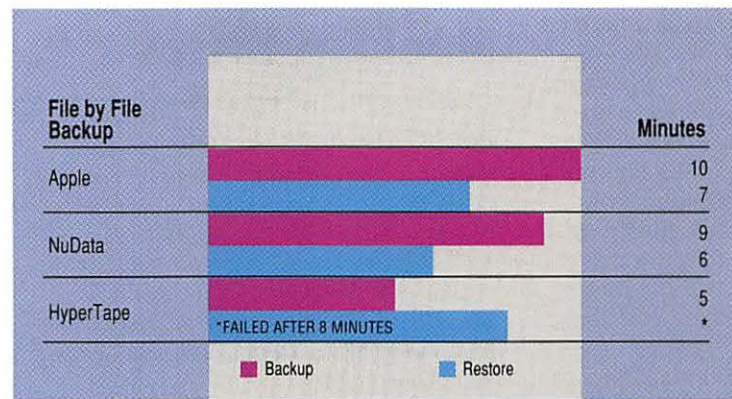
very few people keep their disks filled to the brim. And you can always perform multiple file-by-file backups to archive the extra files.

The Software Difference

The real difference in the units lies in the software. All three units come with software that performs mirror backups of the entire contents of a hard disk as well as file-by-file backups. All of the supplied software utilities can perform incremental backups, adding each day's changes as a new file (or files) on the tape. But the software in the three units differs in flexibility, reliability, and the speed with which it performs backups and restorations.

Apple's drive backs up and restores a mirror image faster than the others, and the restoration is reliable. The software, however, is extremely limited. For instance, individual files cannot be restored from a whole-volume backup. The other units include INITs that let the tape cartridge appear as an icon on the desktop, as if it were just another disk. This allows you the added convenience of performing file-by-file backups by dragging files from the disk to the tape in the Finder. Not only is this easier than backing up using a utility program, it also completely eliminates the need for software. If you back up a drive using this process, however, it takes about three times longer than it would if you backed up the same drive using the manufacturer's software utilities. Even so, only GCC and NuData allow you to choose between convenience and speed.

NuData's Data File software offers the most flexible options for creating a backup set. You can select files to be backed up by folder, individual file, or type (data, system, or application), and you can either include or exclude files based on the contents of the file name. Oddly, the software does not back up folders that have a name that starts with a period (a handy convention for forcing important folders to the top of an alphabetized list). NuData's software is also the slowest when creating a mirror image backup, since it basically performs an intelligent Finder copy (a backup like the one you create when you drag files across the desktop). The up side is that the Data File software is not required for restoration. Restoring only one or two files, however, is time consuming. All files are automatically



Timing for file-by-file backup and restore of files totalling 1247K from a Jasmine 80 external attached to a 2MB Mac II. In attempting to restore with HyperTape, the unit ran for eight minutes and then failed. Data restored during that time was accessible.

selected for restoration, so you have to manually deselect all files you do not want restored. In addition, cosmetic aspects of your folders (such as View preferences and exact placement) are lost after restoration.

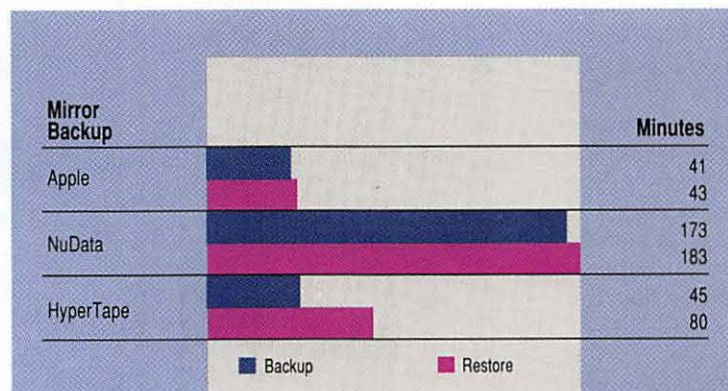
Although the HyperTape software has a pleasing interface, it is bug-ridden. The unit crashed during my first attempt to back up, forcing me to start over. I made two attempts at restoring via file-by-file, but the software failed after several minutes each time. Although the files that HyperTape restored during that period were intact, I was never able to get a complete file-by-file restoration. In addition, this version (5.1) does not let you back up disks that have more information than one tape can hold. Also, since the backup software requires 150K of blank space on the disk from which it is run to do a restoration, it is almost impossible to create a start-up floppy to run the application.

When restoring files to a disk that already contains information, the Apple unit replaces the entire contents of the disk, the Data File gives you the option to replace matching files, and the HyperTape adds the letters *BU* to the end of any restored file that already exists on disk. On a file-by-

file restoration, the Apple restored files to the correct location on the desktop; the NuData restored them in a different location. These problems could be corrected by simply buying a third party's backup program, but you shouldn't have to spend more money after buying something as expensive as a tape backup.

Backing Up AppleShare

You'd think it would be easy to back up an AppleShare server; instead it's a real pain. To perform a backup, you must shut down the server, then back it up as a mirror image locally (that is, at the server) in order to keep folder ownerships intact. You can also back up a mounted volume from a workstation. Unfortunately, with the second method, when you restore the files they all take on the ownership of the person who made the backup. In addition, the server folder does not get saved because AppleShare automatically makes it invisible to all but the server. Since the server folder contains the AppleShare file structure, and may include other files important to a concurrent application, such as InBox, this method doesn't make a good substitute for regular, local mirror backups.



Timing for a mirror backup and restore of 35,288K worth of data from a Jasmine 80 external attached to a 2MB Mac II.

Although all three tape units can perform a local backup, neither Data File nor Apple software can back up a mounted AppleShare volume from a workstation. So users who have an Apple Tape Backup at their workstation cannot back up their own volumes stored on a remote server. It's almost unbelievable that Apple is unable to back up its own server from the Finder.

And Now a Surprise

Wouldn't it be nice if the tape-backup units stored data consistently, if you could just pop a tape from the Apple unit into the Data File and access your data? This would be great for transferring huge amounts of data from one machine to another, since it wouldn't matter what type of tape drive either machine uses. It turns out that with NuData's Data File driver INIT, *all* the tapes in the units tested appear in the Finder as if they were disks. Therefore if you back up with a file-by-file method, it is possible for the Data File to read another unit's tapes. For file-by-file backups, all of the units save data in the same format, but only the Data File comes with software that allows you to read data in file-by-file format from any other unit.

The Best Choice

NuData's Data File is smaller, its SCSI address dial is very convenient, and it comes with the best software of the three units I looked at, especially since it lets you read any tape backed up file by file. However, it is slow, can't back up mounted AppleShare volumes, and disregards the aesthetics of folder placement and design when restoring. Apple's Tape Backup fits the Mac best aesthetically and allows you to stack other drives on it, but it has the least flexible software, neither allowing the tape to appear as an icon on the desktop nor permitting you to back up a mounted AppleShare volume. General Computer's HyperTape was the most solidly built, but currently the software is unacceptably buggy. Both the HyperTape and Data File come with one-year warranties; the Apple product has only a 90-day warranty. After using all three units, I found the Apple Tape to be the best deal overall, followed by the NuData, and then the HyperTape.

—Ben Calica

See *Where to Buy* for contact information.

Rotor Rooter

Apache Strike 1.0

Military helicopter arcade game. *Pros:* Involving and fast-paced; excellent 3-D graphics; digitized sound effects. *Cons:* Lacks variety; doesn't run on Mac II. **Company:** Silicon Beach Software. **List price:** \$49.95. **Requires:** 512KE but some sounds and graphics not functional with less than 1MB; runs on 512K (without new ROM) with one 400K drive, but you must send away for two 400K disks.



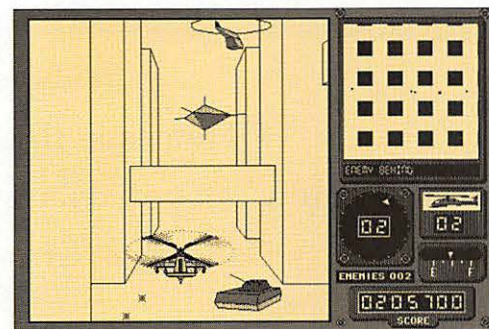
The best indicator that I've come across a truly excellent arcade game is a severe pain behind my right shoulder blade—the result of prolonged mouse use against computerized obstacles and enemies. It means I've gotten involved to the point where I ignore physical suffering. Right now I'm nursing a remarkably sore shoulder—from playing Apache Strike for hours.

In this game, you pilot an Apache AH-64 ground-attack helicopter through a maze of city streets in search of the enemy's strategic defense computer (SDC). You can't control the copter's speed but you can move it sideways or up and down using the mouse. You home in on the SDC using navigation instruments while keeping an eye on the fuel gauge. On the way to the target you encounter hostile tanks and helicopters that you must avoid or destroy. Each time you destroy the SDC you jump up to the next level of difficulty.

The game is immediately involving, partly due to its simplicity, but also because it has the best 3-D graphics I've seen yet in a personal computer arcade game. You've probably seen 3-D games that use wire-frame models. Lines that would normally be hidden from view are exposed so it looks as if you're moving through a vast world of Tinkertoys. In Apache Strike solid objects look solid; buildings are not shaded but combatants are.

Apache Strike is also enriched by digitized sound effects, including the chopping drone of the rotor, machine gun and rocket fire, and explosions. A lifelike digitized female voice warns you of the position of enemies and any damage they inflict. You can't hear this voice on a 512K Mac, but messages appear in a box on the instrument panel, and you can still hear the game's other sound effects. You also can't see the Apache helicopter on a 512K Mac.

I have only one criticism of Apache Strike—it lacks variety. The city's gridlike street plan is always the same. It's true that the game becomes increasingly challenging, but it offers no surprises. The main reason for the absence of variation is the real-time 3-D graphics, which demand a lot of memory and processing power. Since everything but the start-up screen is loaded into memory, adding more variety to the game would have rendered it unplayable on 1MB Macs without compromises similar to those made on 512K machines. Due to the lack of variety, I don't see myself extracting days of enjoyment from this game the way I did from Dark Castle.



The Enemy Behind

The Apache helicopter flies low to the ground as it moves into striking position. You navigate using radar (the gridlike aerial view in the upper right) and the bearing indicator, a compasslike instrument that indicates the direction and distance to the SDC.

Overall, Apache Strike is really involving; within 15 minutes most people are hooked. I tend to be a game pusher at work and Apache Strike had the highest addiction rate of any game I've peddled. It takes several minutes to get the feel of the mouse, and most people have trouble with right turns. Once you master the basics, you can play the game for ten minutes and enjoy yourself; you don't have to make a lifelong commitment every time you play. Apache Strike provides short but intense bursts of fun, but it's not a flight simulation along the lines of Falcon, the excellent F-16 game from Spectrum Holobyte.

I highly recommend Apache Strike to arcade gamers and to people who get tired of strictly business and want a fun break. I know I'll play it again, as soon as my shoulder feels better.—Adrian Mello

See *Where to Buy* for contact information.

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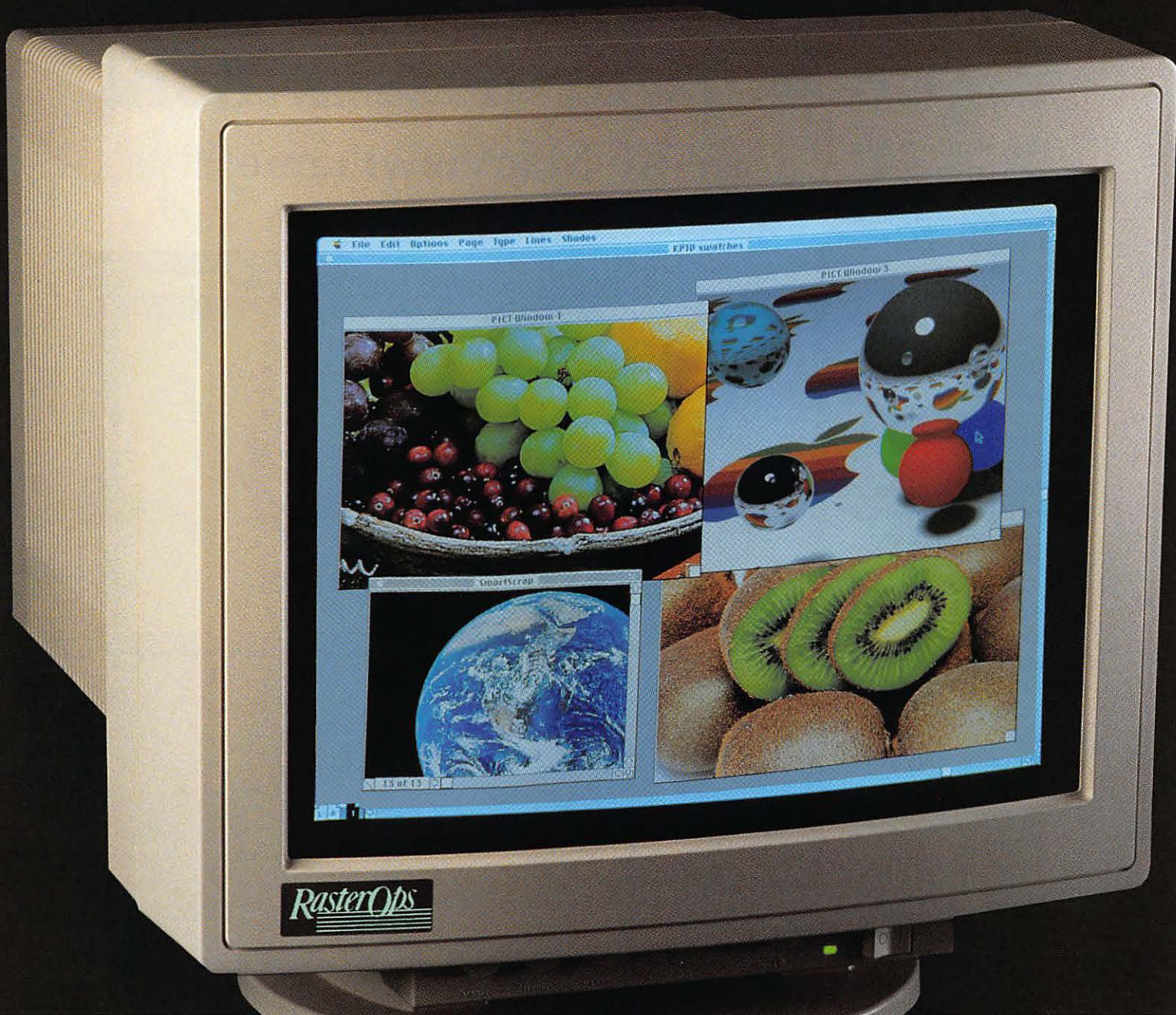
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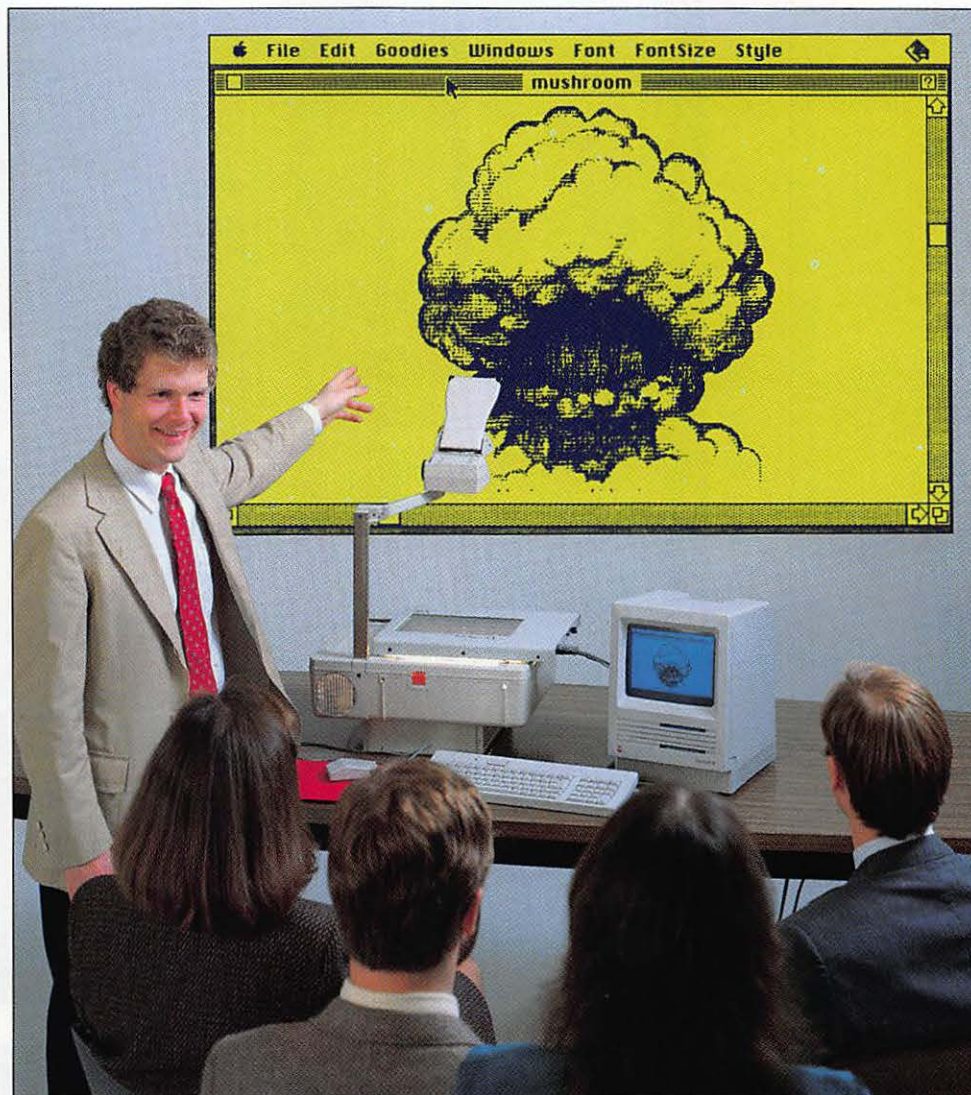
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MacViewFrame is the first low-cost portable LCD computer projection display for the Macintosh. MacViewFrame comes with an attache case, video adapter, interface cable, and power supply.

New Products

*Information on the Mac's latest software,
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Edited by Eileen Drapiza

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

SOFTWARE

ArcMac Shareware program packs, unpacks, and maintains groups of files in an archive format. Compresses data files up to 90 percent and text files up to 60 percent. \$40. dogStar Software, 812/333-5616 (also available on CompuServe and GEnie).

Basketball Challenge, Bermuda Square, Oligopoly, and Pro Challenge Basketball Challenge is a five-on-five real-time college basketball simulation in which you act as the coach. Bermuda Square is a puzzle based on a mathematical equation. \$5000 prize for the best solution submitted before March 1, 1989. In Oligopoly, two to six players compete in worldwide monopoly-building in the petrochemical, manufacturing, electronics, and textile industries. Pro Challenge is a reduced version of NFL Challenge offering the same graphics capability but with only two teams. 512K min. memory; Oligopoly requires two disk drives. Basketball Challenge \$39.95, Bermuda Square \$29.95, Oligopoly and Pro Challenge \$49.95 each. XOR Corporation, 612/938-0005.

Better Blackjack Teaches card counting and advanced play strategy. 512K min. memory. \$30. Grass Roots, 415/283-7135.

Bookmark Desk accessory automatically stores unsaved work to the hard disk at user-defined intervals of minutes or key-

strokes. Can be manually invoked to mark one's place in a document. 1MB min. memory. \$99.95. Intellisoft International, 415/883-1188.

Clip-Art Directory & Guide Book provides information and ratings for over 40 clip-art packages, as well as a HyperCard stack and pictorial index. 1MB min. memory; requires HyperCard. \$49.95. MacTimes Press, 516/775-8841.

Club Stack, StackPak, and SuperStackPak A Club Stack subscription gives you a monthly mailing of two 800K disks packed with the latest HyperCard stacks. StackPak and SuperStackPak are collections of public domain and shareware stacks. Club Stack one-year subscription \$149.95, StackPak 20-disk set \$99.95, SuperStackPak 60-disk set \$239.95. Educomp Computer Services, 800/843-9497, 800/654-5181 in California.

Congress Stack Electronic directory uses 19 linked stacks to organize more than 10MB of information about the 100th Congress, including pictures and biographies of all members, district maps and descriptions, committee and subcommittee assignments, complete staff listings, and more than 12,000 individual address and phone number listings. 1MB min. memory; requires hard disk. \$159.95. Highlighted Data, 703/241-1180.

Conjugate Spanish Helps students generate and learn verb forms. Supplements classroom instruction. 512KE min. memory. \$54.95. Macadamia Software, 615/383-2413.

dScience Data reduction and plotting program that operates on data sets stored in registers. 1MB min. memory. \$495. Spectra Blue, 602/327-4686.

Educomp CD-ROM Complete collection of public domain software and shareware on CD ROM. \$299. Educomp, 800/843-9497, 800/654-5181 in California.

Electronic Design Software Fully integrated PCB production system combines schematic entry, PCB layout, routing, and Gerber Translator. 1MB min. memory; requires Mac II. \$1495. Vamp, 213/466-5533.

Felony and Murder by the Dozen Mystery games in which one to three players team up to solve 12 puzzling crimes. 512K min. memory. \$9.95. Thunder Mountain, 312/480-7667.

Flash&Match An illustrated flash card program drills you on information you enter. French, German, and Spanish language word pairs are also available. 512K min. memory. \$29.95. Individual Software, 800/331-3313, 415/595-8855 in California.

Full Impact Spreadsheet combines analysis and presentation/business report capabilities. Can open eight spreadsheets at once, with eight different views for each spreadsheet. Uses virtual memory to go beyond available RAM. Allows you to create formulas with up to 255 characters within individual cells. Includes macro capabilities. 1MB min. memory; hard disk recommended. \$395. Ashton-Tate, 213/329-8000.

GradeBook Allows educators to record, edit, average, and plot grades easily. The screen display looks like a paper grade book with dog-eared pages and a spiral binding. 512K min. memory; requires 800K disk space. \$99. Bobbing Software, 512/295-5045.

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InnServ B & B HyperGuide Contains hundreds of nationwide listings for bed and breakfasts and country inns. Includes state maps, toll-free reservation line, and free newsletter. 1MB min. memory; requires HyperCard. \$15.95. InnServ, 317/369-2245.

Institutional Advancement Fund-raising and membership information management system based on the Omnis 3 Plus database engine; available in single- and multiuser versions. 1MB min. memory; requires Omnis 3 Plus. Single user \$950, multiuser \$1900. ssTs, 209/667-9424.

MacEnvelope Envelope printing program creates an unlimited number of files that each hold up to 75 names and addresses. \$29.95 plus \$3 s/h. Synex, 718/499-6293.

Macintosh Courses In-house classroom training materials for corporations and other institutions. Available for Microsoft Excel, Word, and the Macintosh Operating System. Instructor kit and 12 sets of student materials \$750. Additional manuals for 4-hour courses \$20 each, 8-hour courses \$24 each, 16-hour courses \$28 each. Logical Operations, 800/456-4677, 716/262-2226 in New York.

MacMailing Creates mailing lists and prints labels. Public domain version allows up to 25 name and address entries. \$9. The Public Domain Exchange, 408/496-0624. Full-featured version handles over 2000 entries and contains other enhancements. \$20. IsleSoft, 2497 W. River Rd., Grand Island, NY 14072.

MacPrices HyperCard stack lists more than 950 Mac software and hardware items with prices for 11 mail-order houses. 1MB min. memory; requires HyperCard. Single copy \$6, one-year subscription \$20. FBN Micro-computing, 804/384-7430.

MacTTY Operates the Mac in digital ham applications. For RTTY, packet, and TTY with RS-422 interface. Supports all common baud rates up to 9600 baud, operating

in Baudot or ASCII. Can be used internationally and for nonradio applications since it offers three different Baudot teletype codes. 512K min. memory. \$39.95. Summit Concepts, 408/462-1632.

Managing Your Money by Andrew Tobias

Personal financial software covers subjects such as basic budget and checkbook management, life insurance, tax planning, and even complex portfolio management. 512KE min. memory; requires two disk drives. \$219.98. Meca Ventures, 203/226-2400.

MHS Message-handling system for wide-area networks allows communication between Macs and IBM PCs. Delivers messages across LANs compatible with MS-DOS 3.1 or higher, AppleTalk LANs, dial-up telephone lines, and through gateways to other messaging environments including IBM's SNADS, DEC's Message Router, and MCI Mail. \$100 per LAN. Action Technologies, 415/654-4444.

ModaCAD Automates fashion design sketching and pattern generation, grading and marking, project management, and manufacturing. 1MB min. memory for complete system; requires Mac II. \$5000 to \$30,000. ModaCAD, 213/271-1977.

MultiSet Shareware that allows you to create and run MultiFinder work-sets that open a series of applications or documents. 1MB min. memory; requires MultiFinder. \$15. Neff Systems Group, 408/274-1110.

OptiDriver Fully integratable software package accommodates all available WORM drives. \$1495. Optisys, 602/277-0600.

Passage 2-D plotting and numerical-analysis program for scientists and engineers who need to analyze large amounts of data and produce graphs. Imports numerical data generated by other programs. 1MB min. memory. \$495. World Precision Instruments, 203/469-8281.

Pict-O-Graph Graphing program that creates pictograms. 512KE min. memory. \$175. Cricket Software, 215/251-9890.

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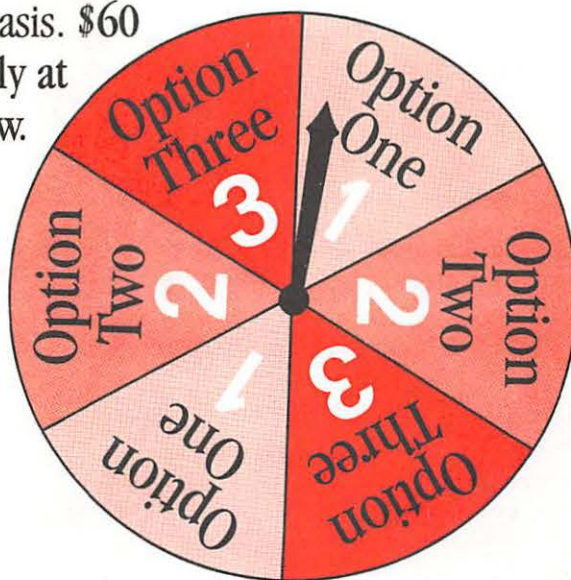
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*Bayside Expo and the World Trade Center conferences are on a first-come, first-served basis with no guaranteed seating.

IT'S YOUR TURN!

This is your chance to pre-register for MACWORLD Expo/Boston, August 11-13, 1988. Please choose your option and fill out this form completely. Then send it along with your payment to: MACWORLD Expo, P.O. Box 155, Westwood, MA 02090. See pre-registration deadlines below. For further information, call Mitch Hall Associates at 617-326-9955. Registration fees are non-refundable.

☐ Option One \$75

Includes Wang Center Conferences,
Pre-register by July 8. No on-site
registration.

☐ Option Two \$50

Pre-register by July 15.
\$60 at the door.

☐ Option Three \$20

Admission to exhibits only.
Pre-register by July 15.

If you choose Option One, you must also check one of the boxes below.
Wang Center seating is limited, so we may sell out before we receive your payment.

- ☐ Please register me for the World Trade Center and Bayside Expo Conferences* and exhibits and return the \$25 difference. ☐ Please register me for exhibits only and return the \$55 difference. ☐ Please cancel my registration and return my \$75 payment.

Please send my badge and further information to:

Please check one: ☐ Home Address ☐ Company Address

Last Name First Name

Mailing Address

City, State, Zip

Telephone

If applicable: Title
Company

☐ Check enclosed (make payable to MACWORLD Exposition) Amount: \$

☐ MasterCard ☐ Visa ☐ American Express Amount: \$

Account Number Expiration Date

(Include all numbers)

Signature

(Signature necessary to be valid.)

If signature is other than registrant, please print name below:

Last Name First Name

Cash only at the door. After July 15, you must register at the show.

Please check the appropriate categories:

Your industry or profession

- a. ☐ Manufacturer (noncomputer)
- b. ☐ Manufacturer (computer industry)
- c. ☐ Distributor/dealer/retailer/service
- d. ☐ Finance/insurance/real estate
- e. ☐ Professional (law/medicine)
- f. ☐ Communications/publishing
- g. ☐ Education
- h. ☐ Government
- i. ☐ Consultant
- j. ☐ Other (specify)

Your title

- k. ☐ CEO/president/vice president
- l. ☐ Comptroller
- m. ☐ DP/MIS manager
- n. ☐ Owner/Partner

Your title

- o. ☐ Engineer
- p. ☐ Doctor/lawyer/dentist/CPA
- q. ☐ Educator
- r. ☐ Consultant
- s. ☐ Marketing
- t. ☐ Sales
- u. ☐ Other (specify)

Size of your organization (number of employees national/international)

- v. ☐ Under 50
- w. ☐ 50-99
- x. ☐ 100-499
- y. ☐ 500-999
- z. ☐ 1,000-5,000
- aa. ☐ Over 5,000

Which personal computer(s) do you own/or use?

- bb. ☐ Macintosh
- cc. ☐ Macintosh Plus
- dd. ☐ Macintosh SE
- ee. ☐ Macintosh II
- ff. ☐ Apple II +
- gg. ☐ Apple IIe
- hh. ☐ Apple IIc
- ii. ☐ Apple III
- jj. ☐ Apple II GS
- kk. ☐ None
- ll. ☐ Other (specify)

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Three ways to play.

OPTION ONE. Register early to reserve your place at a series of special conferences at the Wang Center featuring the gurus of the Macintosh world. Get the inside story from people like Jean-Louis Gasse, Bill Atkinson, Bill Gates, Guy Kawasaki and other Macintosh mavens. One \$75 fee guarantees you a seat at the Wang Center. And it includes admission to all other MACWORLD Expo exhibits and conferences (see details below). You must pre-register by July 8 to attend Wang Center Conferences. Registration is on a first-come, first-served basis. And the number of seats is limited. No on-site registration.

OPTION TWO. Pre-register for MACWORLD Expo by July 15 and save \$10. The discounted \$50 fee allows you to visit all exhibits and attend all seminars at both the World Trade Center and Bayside Exposition Center. Seminars are on a first-come, first-served basis. No guaranteed seating. On-site admission will be \$60, cash only. So register now and save.



OPTION THREE.

Even if you want to visit the exhibits only, we encourage you to register by July 15 and avoid long lines at the door. One \$20 fee and you're on board for MACWORLD Expo/Boston.

If you want to pre-register additional people, please copy both sides of the attached reply device and fill out one for each person. If the registration form is missing from this ad, please call us at 617-326-9955. All registration fees are non-refundable.

Don't miss out on this opportunity to pre-register. Make your move today.



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Minutes

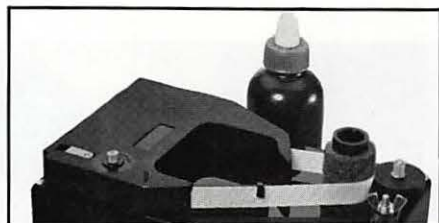
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PSpice Analog electrical circuit simulator for the Mac II. Device Equations Option, Monte Carlo analysis, Probe graphics post-processor, and Parts parameter estimator also available. 1MB min. memory. PSpice

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We created WordPerfect no time flat. Relatively.



We don't mind telling you that we're breathing a collective sigh of relief. After slaving away, we've done it. We've de-

signed and manufactured a powerful word processor that's truly worthy of the Macintosh.

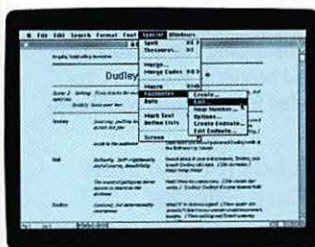
WordPerfect® for the

Macintosh is designed to take advantage of the Mac's outstanding graphics capabilities. And its mouse interface is elegant

and easy to use; WordPerfect's unique hierarchical menus present commands in a logical, accessible manner.

And WordPerfect for the Macintosh comes from a company dedicated to word processing. With proven features that have helped to make WordPerfect the best-selling word processing software in the world.

Those features include



(Left) WordPerfect offers parallel or newspaper-style column options. (Right) The interface is specially designed to be a familiar visual experience for Mac users.

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Introducing the fastest, easiest way to do your personal finances and small business books. Quicken for the Macintosh.*

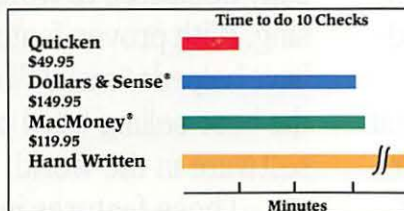
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MW-0688



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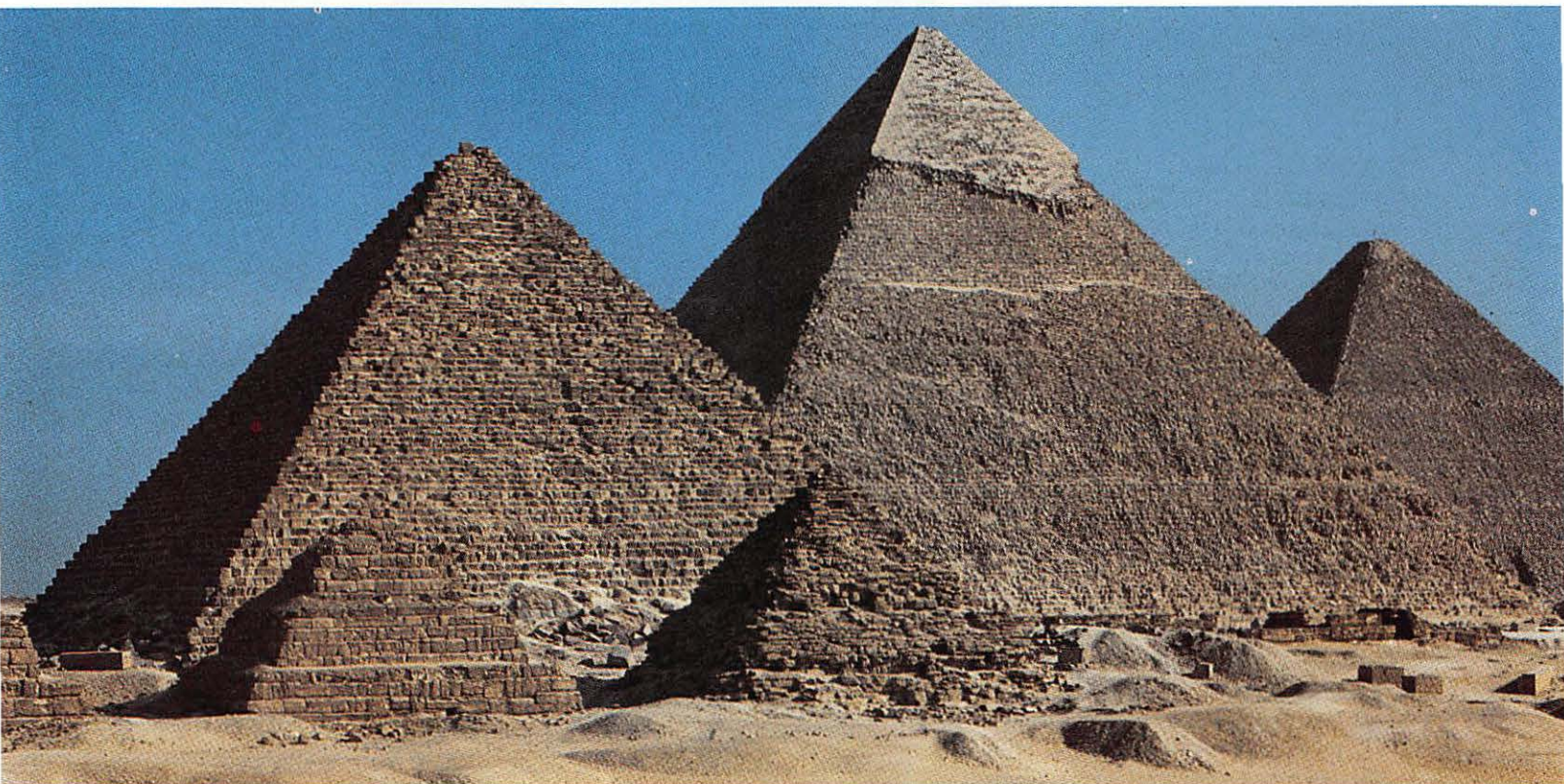
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signed and manufactured a powerful word processor that's truly worthy of the Macintosh.

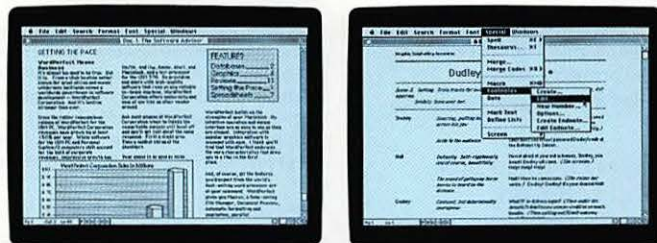
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Macintosh is designed to take advantage of the Mac's outstanding graphics capabilities. And its mouse interface is elegant

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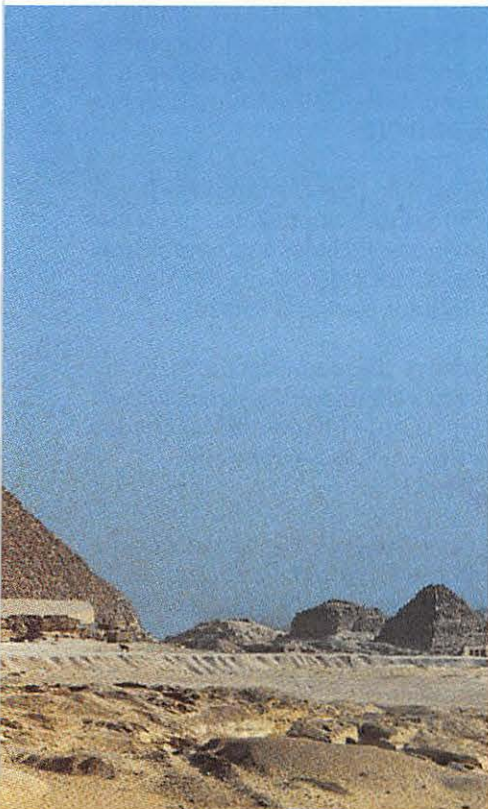
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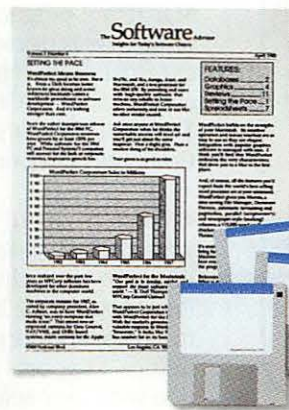
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quickly scan and select files by employing "Word Search."

And, of course, WordPerfect for the Macintosh offers macro options as only WordPerfect can—helping to make repetitive tasks a thing of the past. Everything from memo forms to newsletter formats to complex procedures can be stored via macros with no limit as to number or size.

WordPerfect for the Mac also helps you compile professionally organized tables of contents, indexes, and outlines. It makes footnoting simple. And, using Print Preview, it lets you view your document in miniature so you can check its appearance before printing. Add to all of this a fully integrated, 115,000 word dictionary and a large, rapid-access thesaurus, and you've got the perfect tool for all of your word processing needs.



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Word 3.01 and MacWrite.

Now you know what's gone into our word processor for the Mac. And maybe now you'll forgive us for the short delay. Well, relatively short.

For more information, call or write WordPerfect Corporation, 1555 North Technology Way, Orem, Utah 84057 (801)225-5000.

(In Canada, call 1-800-267-2499.)



WordPerfect for the Macintosh offers extensive, fully integrated dictionary and thesaurus.

parallel and newspaper-style (snaking) column options displayed on screen; automatic formatting and pagination; and a file manager that lets you copy, delete, rename, or print a file right from one WordPerfect dialogue—or



WordPerfect® for the Macintosh

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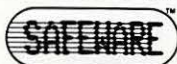
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New Products

ROM, and software for downloading and diagnostics. The physical LAN interface to Ethernet is provided through either a standard DB15 connector or an internal Ethernet-specified Cheapernet transceiver. MacSnap 2SE is a socketed SIMM product utilizing 256K of DRAM, which enhances an SE's memory to 2MB of contiguous RAM. FastNet II \$899, MacSnap 2SE \$499. Dove Computer Corporation, 800/622-7627, 919/763-7918 in Delaware.

HyperDrive FX/60, FX/80, FI/60, FI/80 The FI drives mount in the disk drive slot of the Mac II and plug into its internal power and SCSI connections; the FX SCSI drives are external. Both types offer on-board disk caching. HyperDrive FX/60 \$1699, FX/80 \$1999, FI/60 \$1599, FI/80 \$1899. General Computer Corporation, 617/890-0880.

MacMainFrame II Internal card and software package allows Mac II users to connect with virtually any IBM mainframe. Provides IBM 3278/79 terminal emulation, full color support and file-transfer capabilities. Supports IBM seven-color emulation with user-selectable color choices. Allows text, binary, and document file transfer between Macs and IBM mainframes in CICS, TSO, or CMS operating environments. Less than \$1000. Avatar Technologies, 617/435-6872.

MacStreamer Reads and writes 1/2-inch tape using the Mac. Handles 7- and 10-inch tape reels and allows you to read/write any tape produced in a standard IBM format. Performs ASCII/EBDIC code conversions and code record blocking/unblocking. \$3995. NovaStor Corporation, 818/707-9900.

NuVision Image-processing workstation complete with hardware, software, and support. Principal features are an integral DSP for parallel processing of multiplane images; ability to grab frames of 1024-by-1024-pixel monochrome, RGB true color, and stereo pair images in 1/30 of a second; and flicker-free 1280-by-1024-pixel 24-bit true color display. Software for basic display, spatial, Fourier, geometrical, and morphological processing, including continuous interpolated zoom, convolution, frequency filtering, warping, and blob statistics. Complete monochrome system less than \$20,000. Perceptics, 615/966-9200.

Quantum ProDrive Series Ten 3 1/2-inch drives with formatted capacities ranging from 42MB to 168MB and a variety of interfaces including SCSI, AT-Bus, and ESDI. 40MB \$520, 80MB \$845; higher capacities not yet available. Quantum Corporation, 408/432-1100.

ACCESSORIES

AnthroCart KingSize 48-inch-wide computer table supports up to 150 pounds on its heavy-duty steel frame. Comes with one large shelf and one small shelf. Optional printer basket, slide-out shelf, document holder, and storage basket. Available in slate gray or bone. \$399. Anthro Corporation, 503/241-7113.

Disk Tot'em 3.5 Disk carrying case holds up to 250 3 1/2-inch floppies and has removable partitions. Includes a removable tray and external lock. \$39.95 plus \$3.50 s/h. Totem Technologies, 205/856-2437.

HyperCable Cable connects the Mac's audio port to a telephone. Designed for use with HyperCard's phone-dialing function. \$39 plus \$3 s/h. Caseys' Page Mill, 303/220-1463.

Image I and II Speed Pads Mouse control pads made with material and coating that increases cursor control while reducing friction. Cleanable and stain resistant. Image I pads come in two sizes. Image II pads have a unique, transparent flip-up cover that can hold printed information. Image I Speed Pad 8 1/2 by 11, \$12.95; 7 by 8 3/4, \$9.95; Image II Speed Pad 10 by 11 1/4, \$19.95; 7 by 8 3/4, \$14.95. Data Pad Corporation, 801/225-0699.

Mobile Computer Stand Computer stand made with an enameled steel tube frame and laminated 1 1/8-inch-thick work surface; 36 by 24 inches. Includes locking casters. \$150. Wheelit, 419/531-4900. □

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.



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How to use type

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There's Roger Black, noted pub-

Allan Haley On Presentations:
 “These faces work well over a range of sizes, but particularly well in larger sizes. They also have high impact and good readability—just what you need to make people remember what they’ve read.”

Allan Haley

Executive Vice President of the International Typeface Corporation. Creates typefaces. And tells people how to use them in "fy(t)i," his how-to column about typography and communication that appears in the respected graphic design journal, U&Ic. When it comes to presentation graphics, he can put on quite a show.

Typefaces in the Presentations Publishing Pack:

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HELVETICA® CONDENSED

ITC NEW BASKERVILLE®

Presenting: Allan Haley
For Allan Haley, typography and presentations are inextricably all tangled up together. As Executive Vice President of the International Typeface Corporation, Allan makes a lot of presentations. And they're all about type. So he knows whereof he speaks in talking about both.

But almost nobody starts out at the top and Allan is no exception. He began his career in type as an apprentice typographer. Since then, he's become an accomplished type designer, creating many popular faces and winning numerous awards in the process.

Having grown up in California and now living in New York, Allan is comfortably bi-coastal. A businessman by trade and an educator by inclination, he has a M.F.A. from UCLA where he has also taught. He is a typographer's biographer (he knows who designed every typeface and has some perfectly scandalous stories about quite a few of them), he's the author of the definitive work on photography (entitled appropriately enough, *Photography*), and too many articles to

Simple is best.

One point per slide, with as few words and lines as possible. Reverse type is best for slides. Stay away from all caps. Make graphs simple and easy to read. And use lots of slides. Nothing is more boring than talking for 10 minutes to a single slide.

Use signposts.

Use type and ornaments to guide the reader through your message. Things that say, "Stop here," "This is important," "This relates to this" can help add clarification and emphasis. They also add a little variety. Remember you're selling not boring!

Attract attention.

Use type size and typeface style (but not more than two) to create emphasis and add memorability. Incidentally, boldface works better than italics for this. It's more readable and shows up better.

Feed bite-size

This applies to slides, heads in partare like I. They aren't really reas reacted to. So they designed to make an quickly, and then it's one.

Put out the welcome mat.

Whatever you do, it needs to be inviting. It's competing to time and attention, two commodities in far too short supply these days. The way to make sure your ideas get their share is to make your readers or your audience want to get into what you're presenting.

Look at what you're doing.

From the audience's point of view, Your perceptions and opinions are absolutely valid. Pretend you're one of the people in your audience. Would this presenta-

Erik Spiekermann On Forms:
"Forms and schedules are typically produced fast, in large quantities, on not very high quality paper. These three families will hold up extremely well under those conditions."

INTERVIEW



In 1939, Ernst Spiekermann began his career as a printer and typographer. He was already 21 years old at the time. He had an old print press from 1914 and printed posters for the Dada movement, a cigar box (full of type) and was invited to use both as well that five years later, at the age of 17, he was able to support himself financially by printing. He brought his own type and ink, then, the finance and engraving of someone who was just starting type by hand, in letter at a time.

Between then and now Eric has acquired international colors as a "designer's designer". He has been a member of the English Type Director's Club, and currently heads the firm of MetaDesign in West Berlin as the Federal Republic of Germany.

Eric is a handsome and lively, cheerful, one of the world's venerable type houses, Vernon Miller.

Rhyme & Reason
Having started his early, Erik has had a deal of time to evolve his thoughts on how to architect, but he walks like a breeze about type. "I am most sensitive as a personality to the way I work with 's,' and they look good, y'know?"

like an expert.

lication designer, on newsletters.

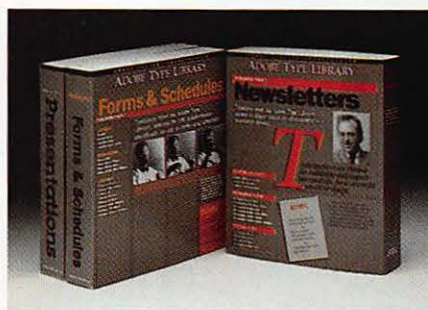
Internationally recognized type designer, Erik Spiekermann, on forms and schedules.

And author, typographer, Allan Haley, on presentations.

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(And you'll come to realize that Palatino isn't a horse at all, but one of the more than 200 typefaces in the Adobe Type Library.)



Erik Spiekermann

Erik Spiekermann heads MetaDesign in West Berlin, Germany, and is an internationally recognized authority on typography and design. Widely published in trade journals both here and in Europe. The German Post Office and Herman Miller use his designs. And now, so can you.

Typefaces in the Forms and Schedules Publishing Pack:

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INTERVIEW

First Impressions

Can a designer who loves good type, good design, and good taste find happiness on a desktop?



Roger Black has designed most magazines that most people read. He has also not directed more of what most people read than almost any other designer in his field. During his distinguished career, he has been director of editorial art at The New York Times, Prior to that, he was chief art director at New York, New York and Rolling Stone. He has also designed for magazines and newspapers all over the world, including Newsweek, Maclean's and Newsday, a Manhattan City daily. Many other designers in this magazine include a list of those who have worked for the publication, as in the case of Newsweek and Rolling Stone. His typography, Mr. Black also has earned attention in his credit. Here, his interview with

You've said that type is the easiest and least expensive way to make a difference. Would you elaborate?

Type is the first impression you have of what you're about to read. Each typeface, like a human face, has a subtle character all its own. Depending on which face you choose, the same word can have

Talk about the three typefaces you selected for this Publishing Pack.

If you think of design as largely a question of playing contrasts and if you're going to have a selection of typefaces for a publication you should have faces with some contrast. Galliard is very swanky and elegant. A good contrast to Franklin Gothic, which is

So much great design has already been done without computers, what's so terrific about using one?

The enchanting thing about computers is that one person can sit down, write, layout, and print whatever they want whether it's poetry, recipes, a book, or a newsletter. You're in control. Completely. It's also immediate. You can proof and refine and correct things instantly. It's like having your own printing press and type house. In fact, it's not like that at all. That's exactly what you have.

What's the major advantage of desktop publishing?

The interactivity. How many times has a traditional designer marked up type only to have it come back and realize there's something wrong with it and it has to be sent back and another day is gone? On the desktop, you simply do it until you are completely happy.

Tell us your thoughts about the design of this Interview page.

This page is a basic 5 column tabular, but because the body of the article starts in the second column, it makes the page seem more spacious. The large question at the top of the second column (which was set in Franklin Gothic Heavy) centers the weight of the page, and it leads the reader's eye down to the beginning of the main body of text. The white space between

If there was one typographic design rule to break, what would it be?

There really is no rule that can't be broken. Take the grid for example, you should be able to play with it and not take it too seriously. It's there as a guide, but if you don't ignore it sometimes, everything you do will look boring. Another thing is, there is no such thing as the right typeface, for example, this page may have worked nicely with the answers set in Franklin Gothic Demi. My point is, you have to experiment a lot to get a good solution. That's one of the real strengths of using a computer, you can change type styles instantly and see how the new settings look.

Are there some tips you'd like to pass along to anyone who is designing a newsletter?

First off, hire a professional (although, I keep the copy to a minimum. That'll let you get the type up bigger. The other thing is, people have a limited amount of time to read these days, so you're going to want to make it as desirable and as easy to read as possible. Make the design simple. Try for contrast. Don't average everything out. If you have favorite publications, imitate them. Personally, I think almost anybody can do some design and put out a decent looking document. It doesn't have to be heavily designed, but a document that has been desktop published, if it's been done thoughtfully, is going to command so much more attention. This technology is a force that is going to move everybody up to where we

Roger Black On Newsletters:

"With these three typeface families, you'll have good contrast, excellent legibility, and a great deal of versatility. In other words, you should be able to do just about anything in a newsletter."

Roger Black

Former director of editorial art for The New York Times, and chief art director at New York, New West, and Rolling Stone magazines. Redesigning Rolling Stone and Newsweek. Internationally sought after as a publication designer. You should see what he can do for a newsletter.

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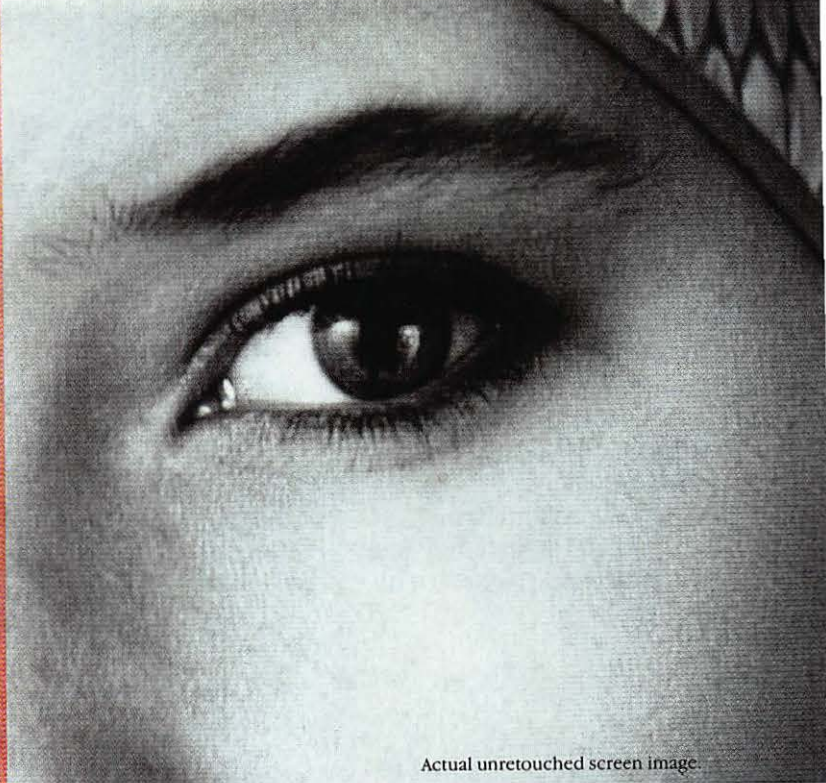
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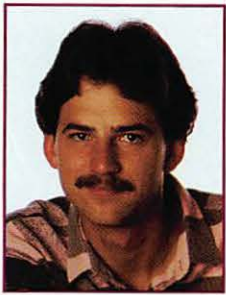


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Quick Tips

Answers to your questions

by Lon Poole

An erratic bug somewhere in the Left/Right Manager of my brain's toolbox ROM caused an error in January's *Quick Tips*, where the instructions for typing opening and closing single and double quotes are interchanged. Wallis Bolz of Redmond, Washington, points out that you press Option-] for ' ; Shift-Option-] for ' , Option-[for " , and Shift-Option-[for " . (Sadly, I can't get a ROM upgrade for my brain. The company that made it has gone out of business.)

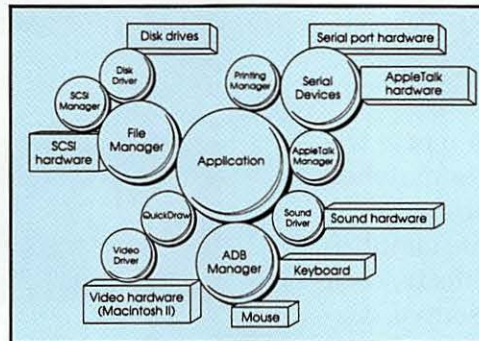
Terror by Tape

If you use a tape drive for disk backup—particularly the type that uses the 40-megabyte 3M tape cartridges—get up right now and make sure there's no tape in the drive. A partially inserted tape can be ruined by stray radiation from within a shielded drive. When you're not using them, you should store tapes in their plastic cases in a cool, dry place. This advice comes from Eric Herzog of Giga Cell Systems (formerly NuData), manufacturer of a well-shielded 40MB tape drive. He's seen people discover that they've unwittingly destroyed their only backup when they try to restore a hard disk from a corrupted tape.

For even more security, buy an extra tape or two and institute a rotating backup scheme. Use tape A today, tape B tomorrow, tape C the next day, and the day after that start the cycle again with tape A. Some people go even further, making a weekly backup to keep in another location in case of fire or theft.

Inside Macintosh Made Easy

You no longer have to read the 2100 pages of the five-volume *Inside Macintosh* to learn about your Mac's internal workings. *Technical Introduction to the Macintosh Family*, an outstanding 300-page book published by Addison-Wesley and priced at \$19.95, fully describes the design



The Simplified Mac

This diagram from *Technical Introduction to the Macintosh Family*, which shows the layers of the Mac's operating system, is one of the book's many technical illustrations that help readers understand how the Mac works. (Reprinted by permission of Addison-Wesley Publishing Company, Inc.)

and operation of the Mac Plus, SE, and II without all the programming details (see "The Simplified Mac"). Aimed at experienced users and novice programmers, the book carefully defines all special terms and explains the Macintosh user interface, the ROM toolbox, Macintosh graphics, system software, files and volumes, memory management, the operating system, resources, hardware, and even A/UX (Apple's version of the UNIX operating system). Although only Apple Computer gets an author credit, we dug a little deeper to find the name behind the scenes: Mark Metzler.

Page Preview from Keyboard

Is there a keyboard shortcut to get Page Preview in Microsoft Word 3.0x?

Lauro Pacheco, Jr.
Berkeley, California

A You can choose any Word menu item from the keyboard, even one with no ⌘-key equivalent. To activate keyboard menu control, press the period (.) key. (If the keypad is in Num Lock mode, press the Clear key first.) Before five seconds have elapsed, press F to pull down the File menu. After that, press P to select the Page Preview command and Return to choose it. For more details on keyboard menu control, see "Keyboard—Menus and Dialog Boxes" in Word's online help, or look under "Keyboard" in the manual.

Word Font Confusion

Why are the fonts listed in the Font menu of Microsoft Word 3.0x different from those listed in the Character Format dialog box?

Bill Neill
Laguna Beach, California

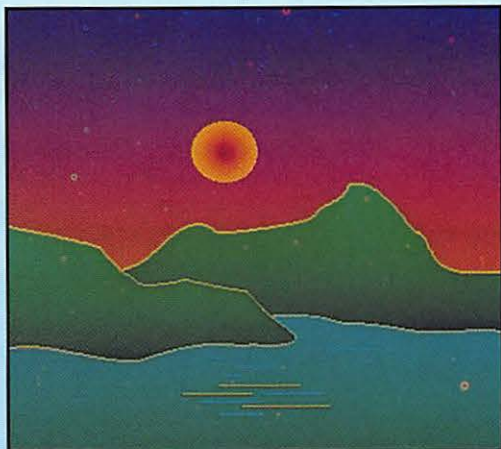
A When you choose Character from the Format menu, you see all available fonts listed. The Font menu includes only the fonts that have been placed in it. The menu can have up to 30 items (an item can be either a font or a font size). You add a font by pressing ⌘-Option-plus (+), which changes the pointer shape to a large plus sign, and then selecting the font from

(continues)

Lon Poole answers readers' questions and offers advice in his monthly Macworld column. A collection of his tips can be found in his book *Mac Insights* (Microsoft Press, 1987).

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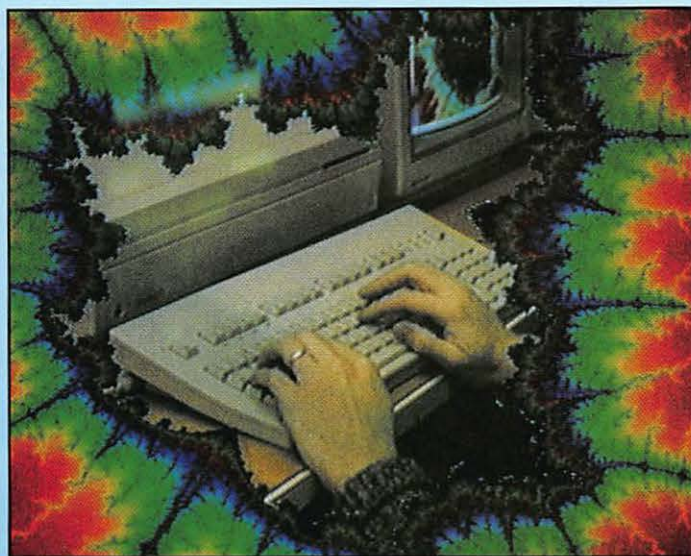
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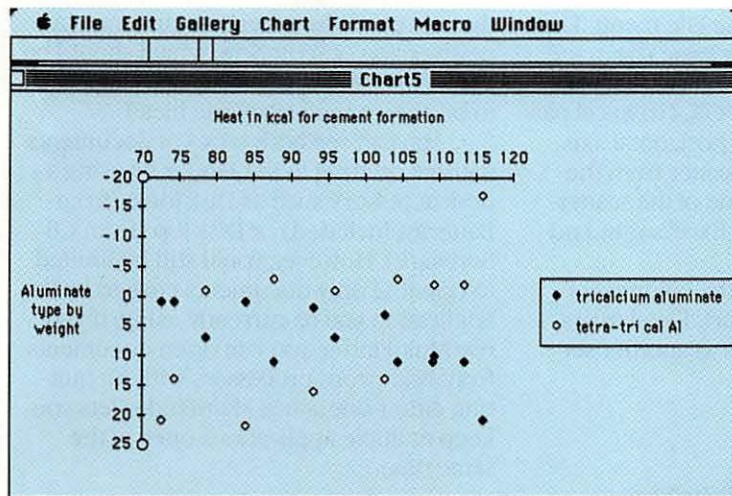
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Nonstandard Plot

This Excel scatter graph uses an unusual y-axis format, with the lower values at the top of the axis and the higher values at the bottom.

AI confirmed with Cricket technical support that yours is the only method that works with Cricket Graph version 1.1. A Reverse Axis option is under consideration for the next update.

I assume you are changing the signs of your data by using the Simple Math command from Cricket Graph's Data menu. With it, you can multiply all values (or selected columns) by -1 and place the results in new data columns all at once. This leaves your original data untouched. After plotting the negative values, you can mask the minus signs in the axis labels with blank text. Do that with the text tool, which you can select after choosing Show Tools from the Goodies menu.

If you use Microsoft Excel, you can easily change the origin of both axes independently. Click the axis to select it, choose Axis from the Format menu, and select the option Values (or Categories) in Reverse Order (see "Nonstandard Plot" and "Reversing Axis").

Incidentally, there's a trick to plotting data pairs on scatter graphs in Excel that not everyone knows. You must arrange the

(continues)

the Character Format dialog box. To remove a font, press ⌘ -Option-minus ($-$) and choose the font from the Font menu.

Plot Origin

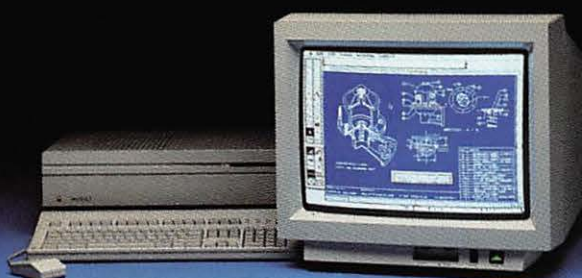
QI am an earth scientist who shares a common frustration with hordes of other Macintosh users. When plotting a scatter graph, we often need to have the origin in

the upper-right or upper-left corner, not in the lower-left. Using Cricket Graph, we have to change the signs of all the data values to get the desired effect. This method becomes a pain when we're using a large database that must be kept intact. Can you suggest a better way?

*James V. Gardner
Moss Beach, California*

19V"/20" Monitor for the Apple Macintosh II

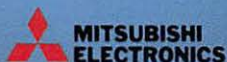
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Value Axis

Range: Automatic OK Cancel

Minimum: ☒

Maximum: ☒

Major Unit: ☒

Minor Unit: ☒

Category Axis Crosses At: ☐

☐ Logarithmic Scale

☒ Values in Reverse Order

Tick Label Position: ☐ None ☐ Low ☐ High ☒ Next to Axis

Reversing Axis

Here's how to construct the y-axis for the graph shown in "Nonstandard Plot." First select the graph's value (vertical) axis. Then, from the Value Axis dialog box, select Values in Reverse Order and set Category Axis Crosses At to -20. (The Axis command from Excel's Format menu brings up the dialog box.)

data so that the first column contains the values for the horizontal axis (the x values) and subsequent columns contain a set of corresponding values for the vertical axis (the y values). Select all the data and copy it to the Clipboard. Next create a new chart

by choosing New from the File menu. Then choose Paste Special (not Paste) from the Edit menu. Select the Categories in First Column option and click OK. (In Excel parlance, *categories* are the horizontal axis values.) Finally, choose Scatter from the Gallery menu and pick one of the scatter-graph formats to replace Excel's standard column-chart choice.

If you simply select the columns of data and create a new chart, Excel treats the horizontal-axis values as another set of vertical-axis values.

MacWrite and WriteNow Together

I have a folder that contains some documents created with MacWrite and others created with WriteNow. How can I get all these documents to appear simultaneously without quitting to the Finder?

Leon C. Nelson
Redding, California

A You don't see MacWrite documents in WriteNow's Open dialog box and WriteNow documents in MacWrite's Open dialog box because neither application can

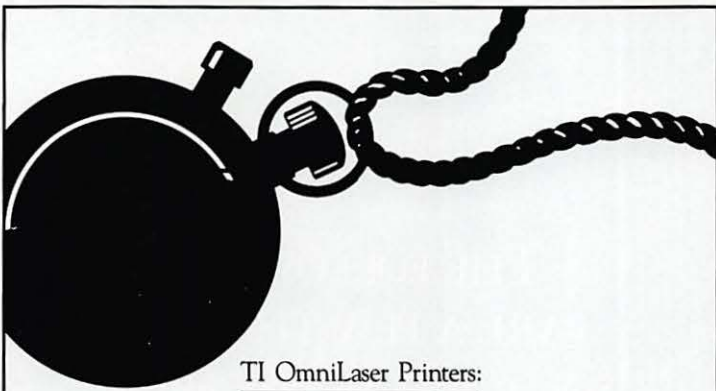
directly open the other's documents. (A new version of WriteNow, which should be out by the time you read this, is supposed to be able to read MacWrite files.)

You can see both types of documents without quitting to the Finder by using a desk accessory such as DiskTools (from Batteries Included) or DiskTop (from CE Software). However, you'll still be limited to opening only documents created by the application you're currently using. If you use MultiFinder, you can open documents from both word processors without quitting either one, since MultiFinder lets you keep multiple applications open at the same time.

System 20, MacWrite 0

I installed Geneva 20 in my System Folder using Font/DA Mover 3.5, but that size still doesn't appear in the MacWrite 4.6 Style menu. What am I missing?

Steven S. Rupp
Santee, California



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A The Style menu in MacWrite 4.6 (and earlier versions) never shows sizes other than 9, 10, 12, 14, 18, and 24, no matter what sizes you install in the System file. MacWrite ordinarily uses the 20-point size only for best-quality printing of 10-point text on an ImageWriter. (The Mac achieves best-quality printing by reducing a double-size font by 50 percent.)

Although you can't choose a font size that's missing from the MacWrite Style menu, you can still use that size in any MacWrite document. You'll need a MacWrite document that contains some text in the size you want, regardless of its font, such as the public domain document Fonts 4 to 48 (available from many user groups and on-line information services). That document contains samples of text in every point size from 4 to 48. Copy a few characters from it and paste them into your MacWrite document. Then select them, change the font if necessary (but not the size), and begin typing. Your words appear in the size you pasted.

Switching from HyperCard

Tip: When using HyperCard with MultiFinder, you can switch to another open application by using the doMenu command from the message box or within a script. For example, doMenu MacDraw would switch to MacDraw, assuming it has already been opened. This works because the doMenu command executes any menu command, and the names of open applications appear in the Apple menu as "commands."

David Medberry
Hill AFB, Utah

Relating Fields

Tip: In HyperCard, when you refer to a field not on the current card (and that reference is on the left side of a relational operator), you must enclose the entire reference in parentheses. The following partial script illustrates:

if (field 3 of card 10) <> field 1 of card 3 then

Without the parentheses, HyperCard objects "No such card." Because the parentheses are not required on the right side of a relational operator, I think this is a bug.

John Ruffner
Culver City, California

What you've pointed out is not a bug but a HyperTalk ambiguity. The parentheses eliminate the ambiguity. If your script contained no parentheses, HyperCard would try to check the contents of field 3 of a card named by the value of the expression 10 <> field 1 of card 3, which would be either True or False. Unless the stack happens to have cards by those names, HyperCard must tell you it can't find the card you specified.

Resize Fits All

Tip: Someone sent me an Excel spreadsheet that was created on a Mac II. Its document window was much too large for my SE screen. Because the window was too long, I couldn't reposition it to reach the size box at the lower-right corner. I found that clicking the zoom box in the title bar resized the window to fit the current screen.

Adrian Mello
San Francisco, California

Clicking the zoom box in any window should resize that window to fit the screen.

(continues)

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Version Retention

Tip: I always like to know what version of a program I'm using, but keeping the version number in the Get Info comments is risky. You can lose it if you ever rebuild the Desktop file. Adding the version number to the name is no more secure. Instead, use ResEdit or any icon editor to add the version number to the application icon. Remember, of course, to do this to a copy of the application where you can afford to goof.

Hank Lavagnini
Heilbronn, Germany

The application icon is an ICN# resource in the application file. See the next tip.

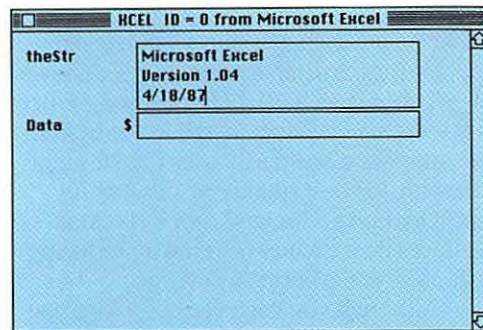
Stubborn Comments

Tip: Rebuilding a disk's Desktop file (by holding down ⌘-Option during start-up or disk insertion) erases Get Info comments. But Finder 6.0 recovers comments for some applications. It uses an application's creator (or signature) resource, whose type is the same as the application's four-character creator type, and whose ID is 0. For example, rebuilding a disk that

contains MacWrite will put MACA resource ID=0 into MacWrite's Get Info comments. Usually the creator resource contains the name of the application and its version number.

Kenneth J. Hornak, Jr.
Ann Arbor, Michigan

You can change an application's creator resource using ResEdit (version 1.1b3 or later). After starting ResEdit, select the application file and choose Get Info from ResEdit's File menu. Note the application's creator type in the info window. Close the info window, open the application file, and look for the resource type that matches the creator type. Open that resource type, select the resource whose ID is 0, and choose Open As from ResEdit's File menu. Find STR in the dialog box's scrolling list of resource types, and double-click it. You can then see and edit the text used by the Finder during rebuilding (see "Change Info"). Close all windows, answering Yes when ResEdit asks whether you want to save changes to the application file. Unfortunately, the Finder doesn't restore Get Info comments for documents.



Change Info

If you know an application's four-letter creator code (in this case, XCEL), you can use ResEdit to change the Get Info comments the Finder uses when rebuilding the Desktop file.

Finder Copy and Paste

Tip: After duplicating a disk or a folder in the Finder, you may want to give the copy the same name as the original. To save typing, use the Copy and Paste commands. Click on the original disk or folder icon, press ⌘-C, click on the duplicate disk or folder icon, and press ⌘-V. In fact, the Undo, Cut, Copy, Paste, and Clear com-

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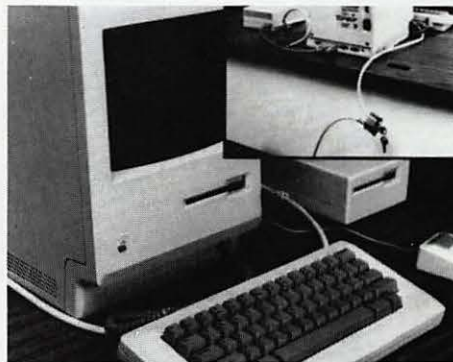
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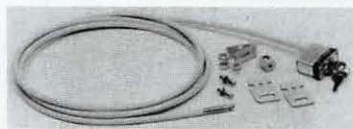
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mands all work in the normal manner for editing icon names in the Finder.

William K. Sacco
New Haven, Connecticut

Almost Trash

Tip: To avoid accidentally throwing away important documents, I have created a folder directly above the Trash Can icon and named it Trash Soon. It is here that I throw away all unwanted documents. Periodically, I open this folder and trash its contents. The longer I can hold off emptying the Trash Soon folder, the greater my chance of finding something there instead of finding it gone for good.

Scott Silverman
Andover, Massachusetts

Unprintable Notes

Tip: In Adobe Illustrator, the ability to make something invisible to the printer can be extremely valuable. Instead of typing notes in the Paint dialog box, you can post them right beside or atop your artwork. Simply type the text and choose No

Stroke/No Fill from the Paint menu. I frequently note the artist's name, line weights, fill percentages, copyright notices, and organizational instructions.

Use the same technique for nonprinting line work. For example, you can show a final paper size, ad boundaries, fold lines, or other guidelines. Create separate files of invisible "graph paper" grids, which you cut-and-paste into the document you're working on.

Mark Powell
Albuquerque, New Mexico

Sounding Off in HyperCard

Tip: While experimenting with scripting music and sound effects in HyperCard, I came up with a bunch of undocumented fine points (see "Insights on HyperCard" in this issue for more sound advice).

HyperCard scripts accept 75 or 80 notes per Play command and then simply stop. And the Option-Return line break doesn't work with the Play command. Just start a new line with a Play command and continue with the note arguments. Restate the tempo on every new command line, or HyperCard reverts to the default, 125.

If you use HyperTalk's ordinal-number music notation form and have trouble

assigning note-length values, insert a pair of ampersands between the pitch and length value: "60&&q", "62&&t", and so on.

Sound-producing buttons feel most natural with a mouseDown handler—that makes them more like a doorbell or a piano key.

Use containers for sound names, pitch, and duration; don't put quotes around container names. You can also skip quotes around uncontained sound names and pitch arguments, as long as they're just one word long.

Craig O'Donnell
Chicago, Illinois

We pay \$25 to \$100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702), The Source (BCW440), or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld. □

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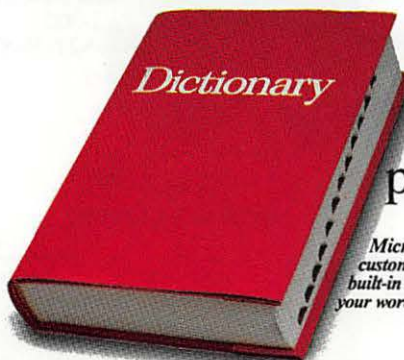
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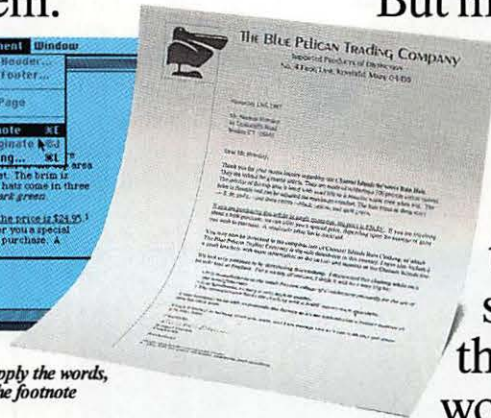
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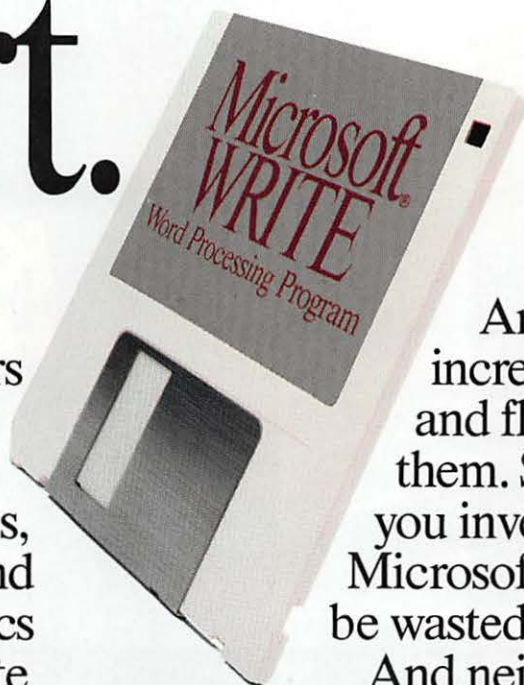
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processor, Microsoft Word, Version 3.

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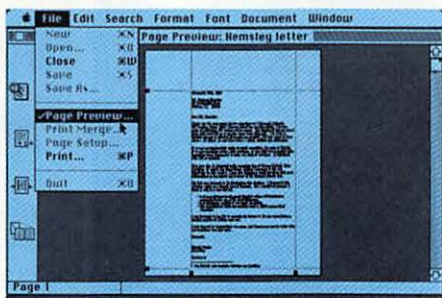
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Getting Started with Multitasking

What multitasking is and isn't, and how MultiFinder works

by Jim Heid

Multitasking—a computer's ability to run numerous programs simultaneously—has been available on the behemoths of computerdom for years, but personal computers have always lacked the processing power and the memory capacity to load and switch between numerous programs.

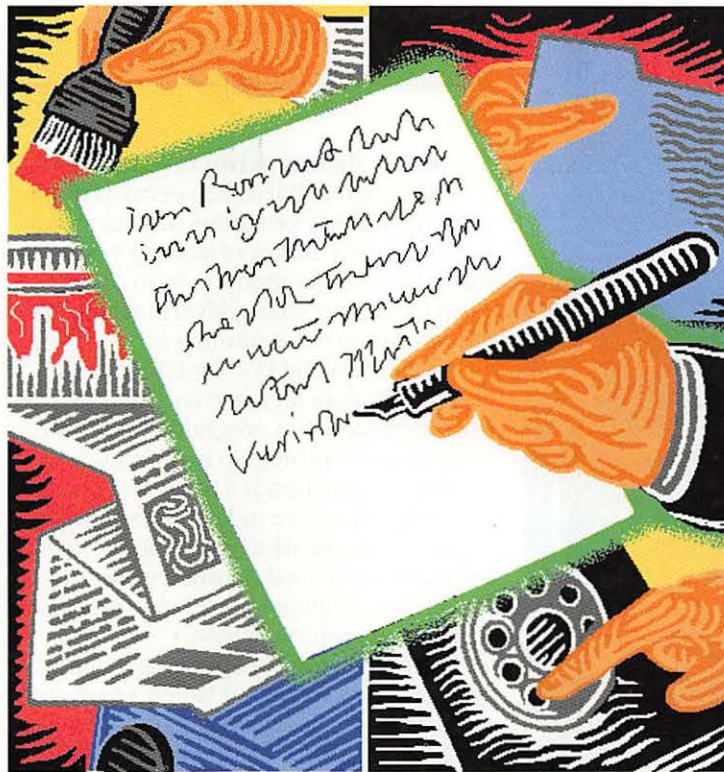
Now multitasking has burst onto the personal computer scene, throwing it into a period of painful transition. In the IBM PC world, Operating System/2 (OS/2) adds multitasking capabilities but may not be able to run many of the PC applications.

Apple is making the transition to multitasking much less painful for Macintosh users. MultiFinder, its new multitasking software, is a separate application that works with the Mac's existing operating system—the fundamental software that transforms the Mac into a working computer. Although MultiFinder doesn't yet have all the capabilities of OS/2, neither does it have all OS/2's compatibility headaches.

The MultiFinder Difference

The Mac has always provided a scaled-down form of multitasking—desk accessories (DAs), small programs (such as Alarm Clock and Calculator) that run on top of an application. But while some DAs are quite sophisticated, ultimately they can only be complements to a full-scale application.

MultiFinder lets you have more than one application on the screen simultaneously and switch between them with a mouse click. When you start an application



SCOTT BALDWIN

on a Mac running MultiFinder, the Finder—the system application you use to start programs and manage files and disks—doesn't disappear as it does without MultiFinder. Instead, the Finder remains in memory and is visible behind the application's window. You can switch back to it by clicking on its desktop or on the small icon at the right end of the menu bar, or by choosing Finder from the Apple menu (see "Back to the Finder"). Once you've returned to the Finder, you can continue

opening applications until you run out of memory—which, on a stock 1-megabyte Mac, usually happens after starting only one or two applications.

In the computer world, the process of putting one application on hold and activating a different one is called *context switching*. It's important to understand that context switching isn't multitasking. Applications that are on hold don't perform any work; they simply hang around on the sidelines, ready to be called into action.

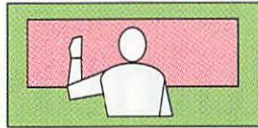
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Jim Heid is a Macworld contributing editor and the author of dBase Mac in Business (Ashton-Tate Publishing, 1987). Each month he turns to a different topic in his column on Mac fundamentals.

MultiFinder's multitasking features will surface when programs designed for them become available. A program written to recognize and use MultiFinder's capabilities will be able to work in the *background*—that is, when it isn't the active application. For instance, a telecommunications program would be able to transfer a file while you were using a different program; a database manager would be able to sort a database; a spreadsheet program would be able to crunch through a complex calculation. Right now, any program can perform background printing to a LaserWriter or some other PostScript laser printer, thanks to an application included with MultiFinder called PrintMonitor (see "Background on Printing").

Any program that performs time-consuming tasks that don't require your attention is a candidate for background operation. You aren't likely to see MultiFinder support in such highly interactive applications as painting or desktop publishing. The only time-consuming, hands-off task such programs perform is printing, and PrintMonitor takes care of that.

Multitasking on the Line



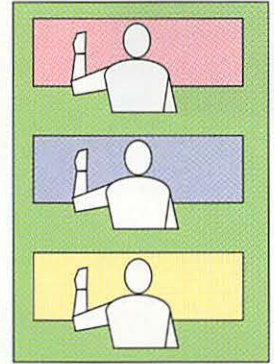
Single-Tasking

One way to understand computer operating systems is to compare them to factory assembly lines. A single-tasking operating system sequentially executes one application's instructions at a time; it's similar to a conventional assembly line, in which work passes from one operator to the next.



Cooperative Scheduling

MultiFinder divides the microprocessor's time among applications, which is comparable to one worker switching between two assembly lines, each dedicated to a different operation.



Parallel Processing

True multitasking operates like a factory with separate assembly lines, each functioning independently.

What Multitasking Is—and Isn't

Although MultiFinder seems to be running multiple programs simultaneously, it's really just a master of deception that actually switches its attention from one program to another so quickly that all the programs *appear* to be running at once.

To understand how MultiFinder creates this illusion, let's step back and look at how computers run programs. Nearly all computers, from Macs to mainframes, execute one instruction at a time, in sequence. (The exceptions are today's ultra-powerful supercomputers, which use a new computing technique called *parallel processing* that enables multiple processors to execute instructions simultaneously.)

In a multitasking operating system, each program you run is called a *task*, or a *process*. When several programs are running, the computer is still executing one instruction at a time. However, the operating system switches its attention from one program to the next, executing a certain number of one program's instructions before putting that program on hold and turning to the next one (see "Multitasking on the Line"). *Task switching* occurs so quickly that all programs appear to run simultaneously.

Time to Run

You don't have to understand how MultiFinder divides its time between programs in order to use it, but a bit of background will help you appreciate the

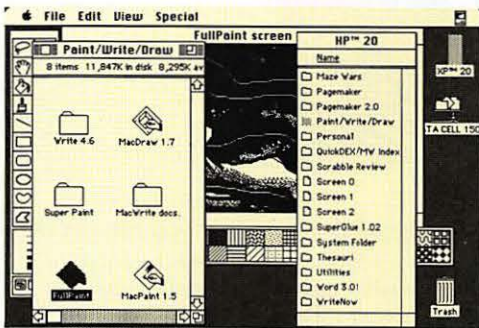
complex juggling that goes on inside a multitasking operating system.

The portion of an operating system that divides the computer's resources among tasks is the *task scheduler*. The two basic approaches to scheduling tasks are *preemptive* scheduling and *cooperative* (also called *nonpreemptive*) scheduling. MultiFinder uses the second approach.

With preemptive scheduling, the task scheduler is tied to the internal "heartbeat" that all microcomputers use to time the updating of their video display and keep the contents of their memory chips refreshed. The task scheduler gives each task control of the computer's resources for a specific number of heartbeats. When they've elapsed, the computer's operating system puts the current application on hold, turning its attention to the next one.

With cooperative scheduling, the task scheduler plays a more passive role in allocating processor time. The responsibility for dividing the processor's time is shared among all the applications that are running. Each application must return control of the processor to the operating system at frequent intervals so that other applications get their turn to run. If one program hogs too much of the processor's time, others slow to a crawl. Worse, if that program crashes, the whole system is likely to crash,

(continues)



Back to the Finder

The top screen shows FullPaint running; though its icon has replaced the Mac system icon in the menu bar, the Finder's desktop remains visible. The bottom screen shows the Finder active; FullPaint's icon appears hollow, since the application is already open.

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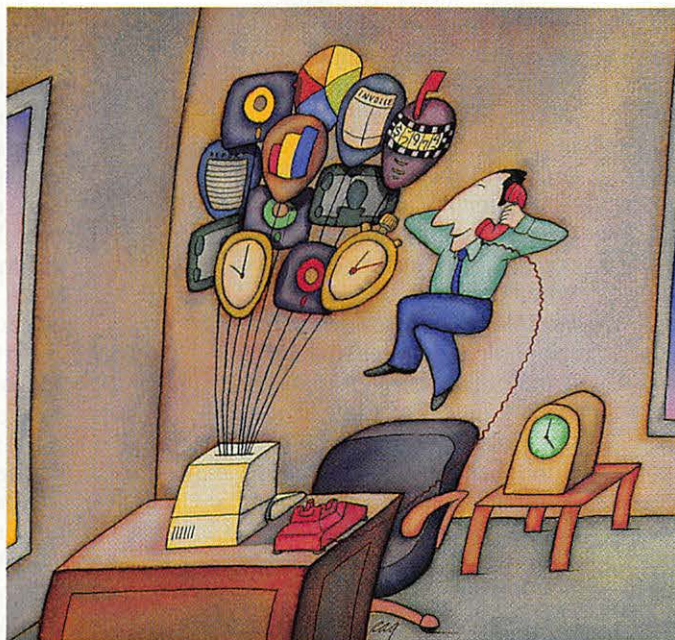
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Background on Printing

Printing to a LaserWriter or another PostScript printer is like standing in line in the Soviet Union to buy vodka: the result is great, but you hate the wait. The PrintMonitor application that accompanies MultiFinder lets the Mac print to a LaserWriter or another PostScript printer in the background. PrintMonitor won't make your pages appear more quickly—indeed, they'll probably take longer, since PrintMonitor must share processor time with other applications. But like any spooler, PrintMonitor lets you resume work sooner by intercepting data en route to the printer, saving it on disk, then returning control of the Mac to you while it sends your document to the printer.

To activate background printing, open Chooser from the Apple menu, select the LaserWriter printer driver, and then select the Background Printing On button. (If the Background

Printing buttons are disabled, you aren't running under MultiFinder.) Subsequently, when you issue a Print command, the Mac creates a *spool file* containing the document's contents. A small and always-active application called Background (located in the System Folder) constantly looks for spool files. When it detects one, it starts PrintMonitor, which sends the spool file's contents to the printer in the background. PrintMonitor's window lists the documents waiting to be printed and lets you postpone printing, schedule printing for a specific time, or rearrange the order of the waiting documents.

For now, background printing from Apple isn't in the cards for ImageWriters. However, SuperMac Software's SuperLaserSpool does print to ImageWriters in the background and is fully compatible with MultiFinder.

since the haywire application may never return control to the operating system. An operating system that uses cooperative multitasking is a chain that's only as strong as its weakest link.

The differences between preemptive and cooperative multitasking are like the differences between traffic lights and yield signs. Traffic lights govern the flow of cars in a rigid way: traffic from each side street flows only as long as the traffic lights allow it (assuming some yo-yo doesn't run a red light). Yield signs, however, turn driving into a cooperative effort. Traffic flows smoothly only when all the drivers cooperate and take turns using the intersection.

IBM's OS/2 and Apple's A/UX—a Macintosh version of the UNIX operating sys-

tem prevalent in academic, scientific, and engineering environments—use preemptive multitasking schedulers. But because a Mac program spends much of its time waiting for an *event* such as a keystroke or a mouse movement to occur, cooperative scheduling is a better approach for MultiFinder. When MultiFinder senses that a foreground application isn't receiving any events, it says, in essence, "Attention, background task #1: the foreground application isn't receiving any events at the moment, so now's your chance to run." It's then up to the background task to say, "I'm turning things back over to you, MultiFinder."

Some multitasking gurus criticize MultiFinder's cooperative scheduling for not maintaining more control over the allocation of processor time among tasks. But the bottom line for Mac users is MultiFinder's excellent performance when ap-

plication developers follow Apple's guidelines, which stipulate how applications that perform background tasks should operate.

The Cost of Multitasking

Because MultiFinder divides the processor's time among background applications, the Mac's performance slows when applications run in the background. An application usually runs slower in the background than in the foreground, and a foreground application runs somewhat slower than it would if no background application were running. As a general rule, the Mac's overall performance slows with each background task you add. Of course, on faster Macs, the lag is less noticeable. A Mac II is better at multitasking than a Plus or an SE.

However, this rule doesn't apply when an inactive application isn't performing a background task. For example, if Microsoft Word and PageMaker are both running, neither imposes a direct performance penalty on the other, since neither is written to perform background tasks.

While one drawback of MultiFinder affects your stopwatch, the other hits your bank account. Keeping multiple programs close at hand requires a hard disk, and keeping them in memory at the same time requires lots of memory. After loading MultiFinder, a 1-MB Mac becomes, for all practical purposes, a 512K. Run Microsoft Word, and less than 160K remains—that's barely enough for MacPaint version 1.5 and far from enough for a sophisticated painting program, a spreadsheet, or a publishing program. You'll need at least 2MB of memory to switch between two or three heavyweight applications such as Word, Excel, and PageMaker.

One way you can cram more into your system's memory is to carefully choose the applications you combine and to adjust their memory requirements using the Finder's Get Info command, as described in Chapter 4 of Apple's documentation, *MultiFinder User's Guide*. (For more survival tips, see "Living with MultiFinder.")

What MultiFinder Can't Do—Yet

Despite MultiFinder's talents, it lacks features common in other multitasking operating systems, including OS/2 and A/UX. But by providing for context switching and background tasks, MultiFinder does what many people need: runs multiple programs

(continues)

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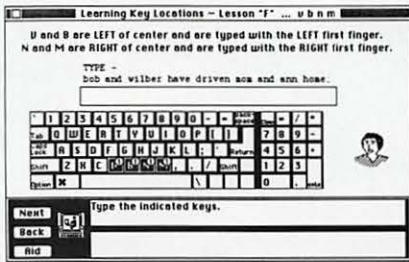
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How To/Getting Started

Living with MultiFinder

The following tips can help you keep pace with MultiFinder. (For more details, see "Insights on MultiFinder," *Macworld*, April 1988).

■ **Verify compatibility.** MultiFinder was designed to run properly written Mac programs, but not every program is properly written. Developers occasionally bend Apple's programming rules. Make sure your programs are fully compatible with MultiFinder before trusting serious work to them. And even then, save before switching programs.

■ **Master MultiFinder navigation.** When several programs are open under MultiFinder, locating a given application's window can be difficult. You have three ways to switch: clicking within an application's window, clicking the icon above the right end of the menu bar, or choosing the application's name from the Apple menu.

■ **Master MultiFinder's memory-tuning features.** Using the Finder's Get Info command, you can tell MultiFinder how much memory to give an application. Allotting an application less than the recommended memory will prob-

ably slow its performance but will free memory. Allocating more than the recommended amount can improve an application's performance.

■ **Open desk accessories in an application layer when memory is tight.** Under MultiFinder, a system file called DA Handler runs all DAs in one "layer." But you may not be able to run DA Handler when little free memory remains. The solution: Open a DA in an open application's layer by pressing Option while choosing the DA from the Apple menu. With this approach, the DA uses the memory MultiFinder has already allocated for that application.

■ **Don't use MultiFinder if you don't need it.** If you don't need one-click application switching or background PostScript printing, don't use MultiFinder. If you need background printing but not fast application switching, use a print spooler. Use the Finder's Set Startup command to specify whether or not your system should start up under MultiFinder. If you occasionally want to start up with the Finder, you can bypass MultiFinder during start-up by holding down the \mathcal{A} key.

simultaneously and relegates time-consuming tasks to the background.

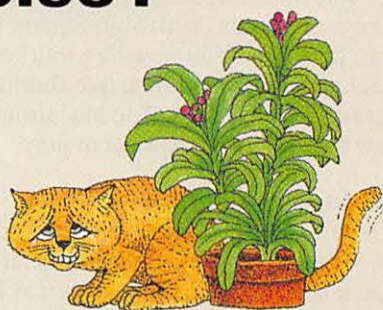
One feature on the horizon is *interprocess communication*—the ability of programs to communicate with each other in "real time" to exchange data. With a future version of the Mac operating system and with applications that support interprocess communications, you'll be able to create dynamic documents that change as their underlying data changes. For exam-

ple, you might use a telecommunications program to shuttle online business information into a spreadsheet, which you'll use to create a graph that you'll paste into a word processing document. When a value in the spreadsheet changes, the graph changes, too—both in the graphing program and in the word processor.

Apple hopes to provide interprocess communication not only between programs, but also between Macs on a network. Then a workgroup could create documents whose components remain

(continues)

Has that statistics package you thought was a tiger turned out to be something else?



Most Mac statistical packages call themselves 'professional,' 'comprehensive,' or 'complete.' But feed them some *real* problems, and you'll discover how toothless they really are. ■ They can't do multivariate procedures ■ Or analyze financial time series ■ Or fit nonlinear models ■ Or compute large, multi-way cross tabs

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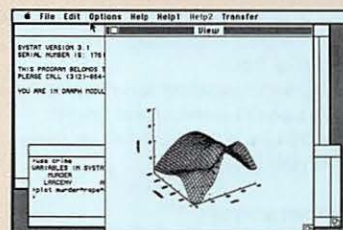
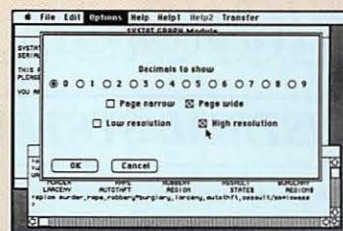
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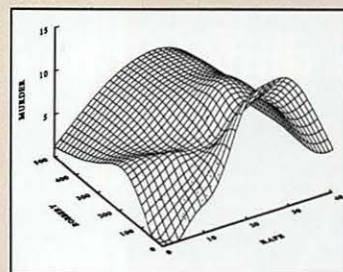
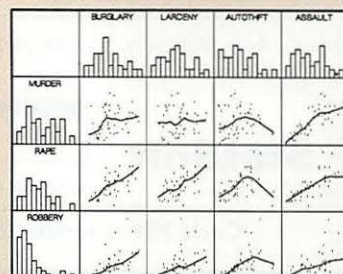
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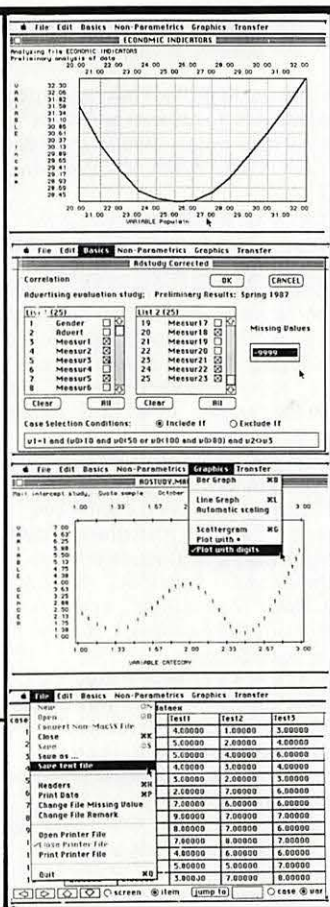


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How To/Getting Started

current as various users change their contributions. Microsoft is particularly interested in Apple's plans for interprocess communication, since it's planning an update of Excel that will have dynamic data-exchange features similar to those of its new IBM version.

A future Mac operating system will also manage memory better by using special memory-management hardware (such a chip is available for the Mac II and is required for use with AU/X). With improved memory management, the Mac will be able to run more programs simultaneously. A common memory-management technique called *virtual memory* uses a hard disk as an extension of the computer's memory, *swapping* programs to the hard disk as necessary to free memory. Virtual memory allows you to run more programs than memory would usually hold.

It's also likely that future versions of the Mac operating system will provide a better way to manage multiple-application windows on screen. With MultiFinder, it's easy to litter the desktop with windows; managing windows is much like shuffling papers on a messy desk. The Mac shouldn't imitate a real desktop *that* accurately.

Taking You to Tasks

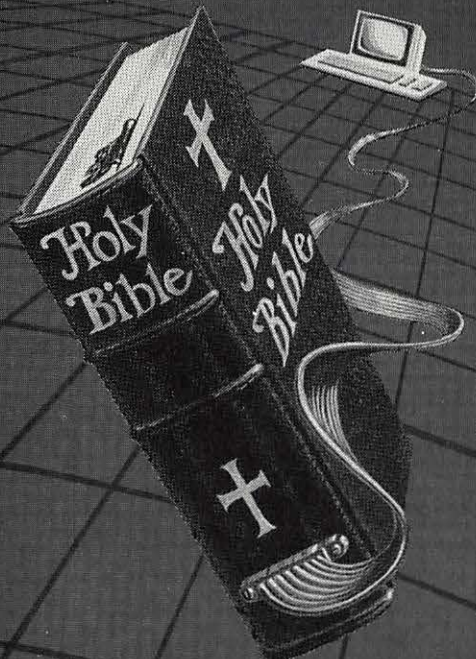
MultiFinder is part of Apple's System Tools 5.0 package, which is available at Apple dealers for \$49. Some dealers may let you copy their System Tools 5.0 if you supply your own disks, but I recommend buying Apple's package for its documentation.

If you aren't using MultiFinder now, should you? It depends. If you have a 1MB Mac, MultiFinder has little to offer, except background PostScript printing. And you can get that without MultiFinder by using a spooler. (See "Speaking of Spoolers," *Macworld*, June 1987.) Even with extra memory, MultiFinder is useful only if you frequently switch between applications or if those applications exploit its background execution feature.

Fortunately, the Finder's Set Startup command gives you the choice of running with or without MultiFinder. You can use MultiFinder when you need its talents, and the "single Finder" when you need all your system's memory for a single application—and for those times when you just don't feel like doing two things at once. □

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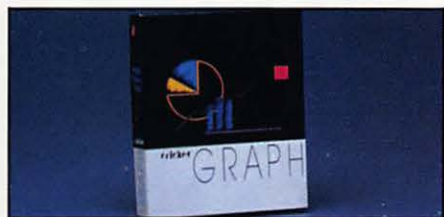


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E. Own two or more	E. _____	E. _____	E. _____
F. Purchase or acquire	F. _____	F. _____	F. _____
G. Establish specifications	G. _____	G. _____	G. _____
H. Recommend to others	H. _____	H. _____	H. _____
I. Sell	I. _____	I. _____	I. _____
J. Train people to use/ or provide support	J. _____	J. _____	J. _____
K. Use	K. _____	K. _____	K. _____
L. No involvement	L. _____	L. _____	L. _____
Z. Other (specify by name and quantity)	Z. _____	Z. _____	Z. _____

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Business Clinic

The Macintosh matches real estate buyers with available properties—then writes customized letters to spread the word

by **Danny Goodman**

This month's solution is prompted by a letter from Chris Gibbs, a real estate agent with First Colorado Land Office of Salida, Colorado, who wishes his Macintosh could help him match sales prospects to properties. He writes, "It would be great if I could enter a new listing into the property database and create a mail merge letter with a word processor to generate a quick notice to the prospective buyer."

This is a common situation not just in real estate, but in all sales prospecting. To uncover a customer's interest in a product, good salespeople ask questions to learn what the customer seeks, what the price range is, and so on—a process called qualifying the customer. The more specific the qualifying questions are, the sooner the salesperson can recommend a product that meets the customer's needs.

The situation is a bit more complex in a real estate environment because the inventory of products—properties—constantly changes. In a busy market, a salesperson may not be aware of a newly listed property that would be a perfect match for a client. That's what makes the solution described here so valuable.

The Problem

In speaking with me, Chris Gibbs made it clear that he wanted as much automation as possible—something we should all strive for in any Mac solution. The simple, but manual, way to match properties to clients would be to perform a very specific search on the client database, selecting criteria that match the specifications of a newly listed property. Automating the pro-

cess, however, means that the property database software must first define the search criteria and then initiate the search. Both 4th Dimension and dBase Mac offer this kind of flexibility with a bit of sophisticated programming, but since Gibbs had already started putting his data into HyperCard, I went in that direction. Lotus's Modern Jazz may also be up to the task when it is released.

I suggest creating two HyperCard stacks, one for clients and one for properties, plus a form letter in Microsoft Word. A single HyperTalk handler, albeit a long one, reduces the entire matching and letter-writing procedure to three steps for the user: first, click on a button in a property listing card; second, select how broad or narrow the search should be; and third, choose Print Merge from Microsoft Word's File menu. Once you specify the range for the search, a HyperCard script finds the

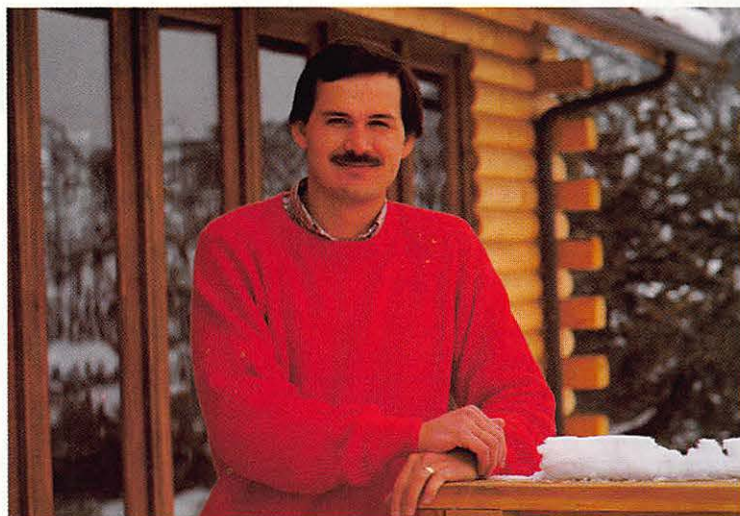
matching client cards and exports information about the client and the property to a data file, which merges into a Word form letter.

Overall Structure

This model HyperCard application and Word template includes all the scripts and techniques you'll need to build your own version. The example shows scant information about the properties and clients. Customize and build onto our model as you see fit.

To make this system work, there must be a common denominator between the cards for clients and properties. As you type specifications into a client card (that is, features that the client desires in a home), HyperCard assembles the features into a hidden field on the card. To allow

(continues)



Real estate agent Chris Gibbs of Salida, Colorado, asked for help matching his clients with the mountain properties he sells. Danny Goodman devised a pair of HyperCard stacks that matches them automatically.

Danny Goodman, a Macworld contributing editor, is the author of *The Complete HyperCard Handbook* (Bantam Books, 1987).

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Background script for Client Records stack
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matching, the same specifications must also be on the properties cards. Thus, when a search for matching clients begins,

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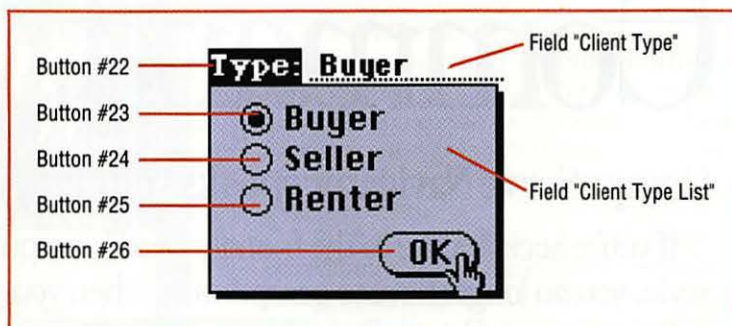
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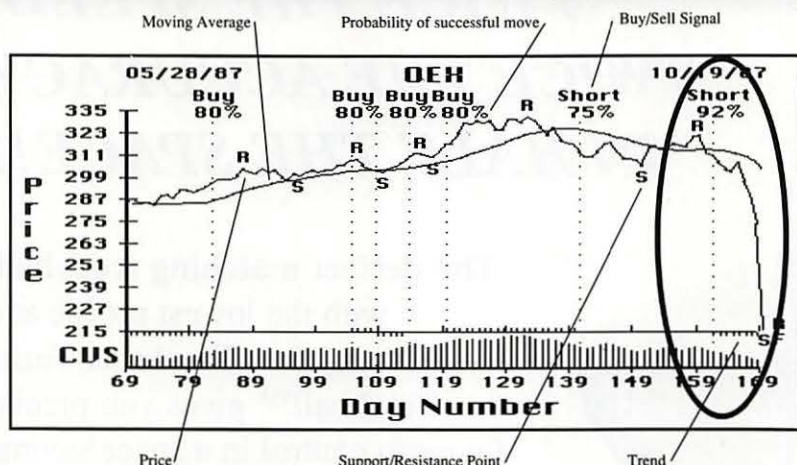
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Notice in "Matchmaker Stacks" that several field labels have boxes around them. These boxes signify buttons which, when clicked, present a list of choices for that field. You create the boxes themselves as background graphics (using the rectangle tool) and then place transparent buttons over them.

To make the lists that go with those boxed buttons, first create a shadow-style background field, then radio buttons for items in the list, and finally one rounded rectangle button as the OK button (see "Butttdown Lists"). For the sake of simplicity in scripting, create the buttons one after another so that they have sequential button numbers. Listing 1 includes the scripting behind all the parts of the button list in this figure. When you create your own version of this stack, the button numbers may differ. Check the Button Info dialog boxes of your buttons to determine their numbers and substitute those numbers in your scripts. (Listing 1 also shows the background handler for the stack and the handler for the History button.)

(continues)

Matchmaker Stacks

Two related real estate HyperCard stacks, for clients and properties, share a number of identical fields. Data from the property stack fields define the search criteria in the client stack. HyperCard searches the Client Records stack to find buyers who would be likely to show interest in a particular piece of real estate.

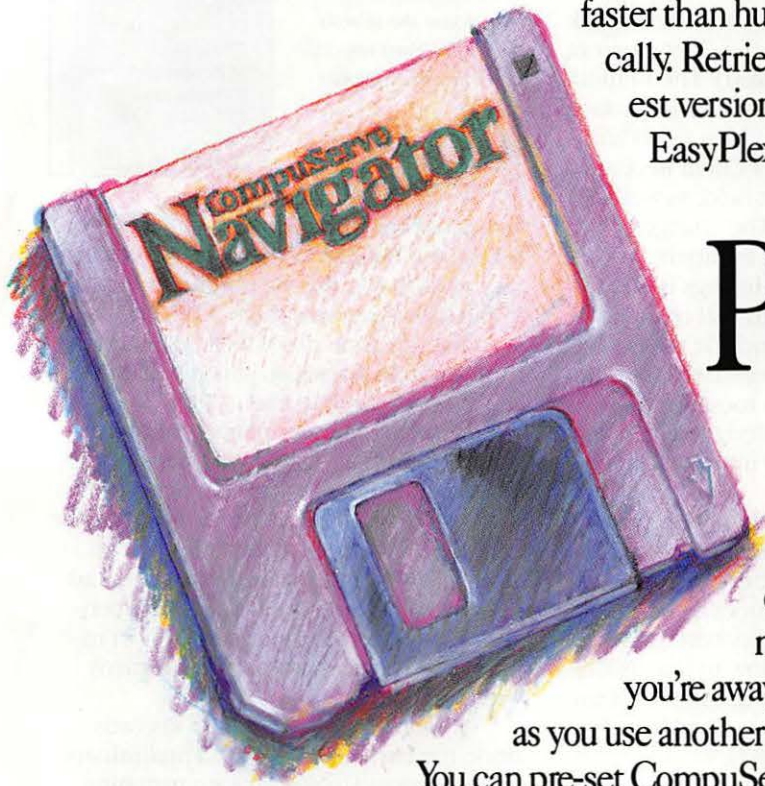
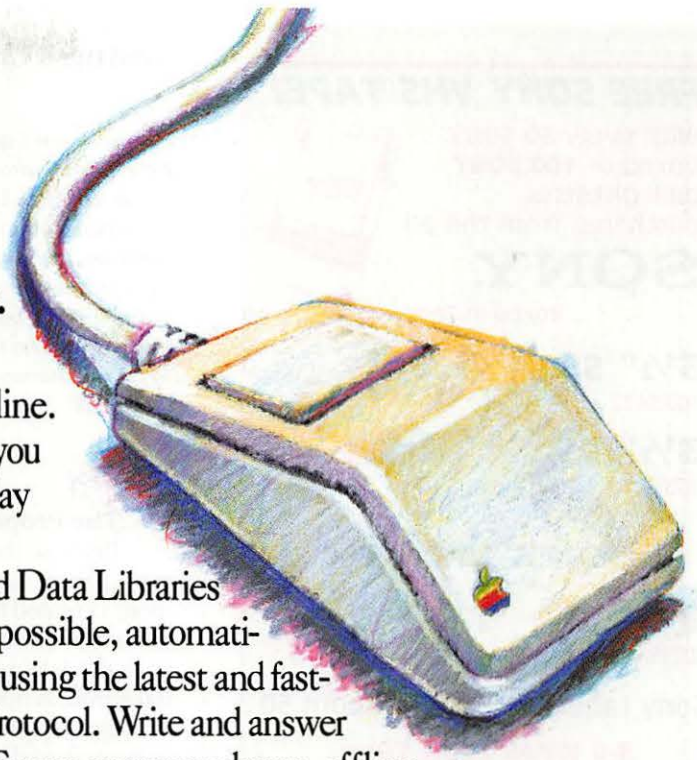
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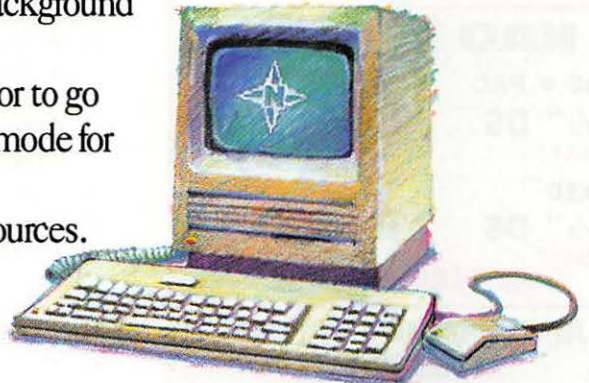
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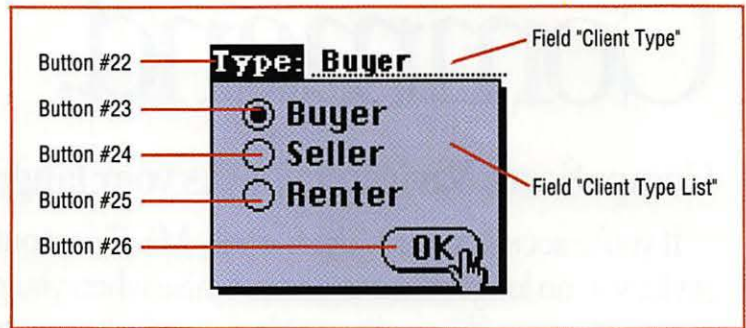
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(continues)

Scripts for Property Listings stack

Button 1: To Client Records

```
on mouseUp
    go "RE Clients"
end mouseUp
```

Button 2: Find Client Matches

```
on mouseUp
    set lockScreen to true
    put "Search On..." into line 2 of field "Search List"
    show field "Search List"
    repeat with x = 21 to 30
        show bkgnd button x
    end repeat
    set lockScreen to false
end mouseUp
```

Scripts for buttons in "Match Criteria"

Button 29: Cancel

```
on mouseUp
    set cursor to 4
    set lockScreen to true
    hide field "Search List"
    repeat with x = 21 to 30
        hide bkgnd button x
    end repeat
    set lockScreen to false
end mouseUp
```

Button 30: OK

```
on mouseUp
    set cursor to 4
    set lockScreen to true
    hide field "Search List"
    repeat with x = 21 to 30
        hide bkgnd button x
    end repeat
    set lockScreen to false
```

```
-- build the list of key words to search Client Stack
put empty into featureList
if the hilite of bkgnd button "Location" is true
then put field "Location" & " " into featureList
if the hilite of bkgnd button "Bedrooms" is true
then put field "BRs" & " " after featureList
if the hilite of bkgnd button "Baths" is true
then put field "BAs" & " " after featureList
if the hilite of bkgnd button "Family Room" is true
then put field "FR" & " " after featureList
if the hilite of bkgnd button "Garage" is true
then put field "Garage" & " " after featureList
if the hilite of bkgnd button "Property Spec" is true
then put field "Property Type" & " " after featureList
if the hilite of bkgnd button "Style Spec" is true
then put field "Style" & " " after featureList
if the hilite of bkgnd button "Constr. Spec" is true
then put field "Construction" after featureList
```

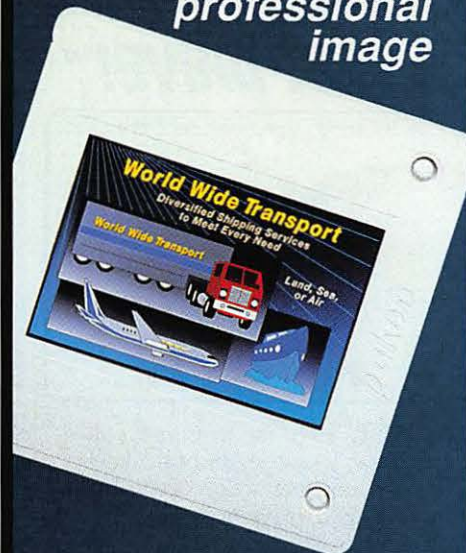
```
-- capture property data for export to merged letter
put field "Property Type" into propertyType
put field "Style" into propertyStyle
```

(continues)

Listing 2

Sample button handlers from the Property Listings stack. Button 2 displays the selection list shown in "Match Criteria," whose OK button is the power behind this entire model.

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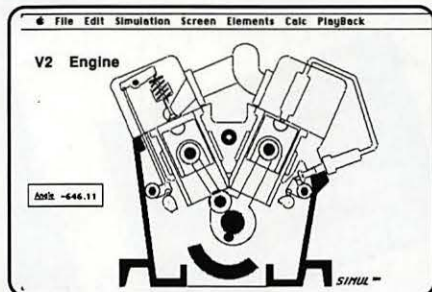
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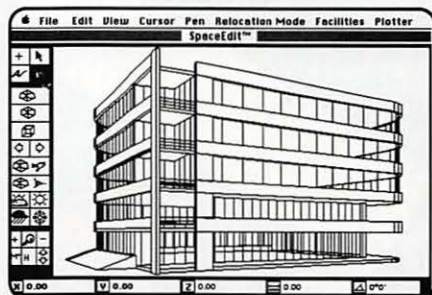


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```

put field "Construction" into propertyConstruction
put field "Asking Price" into askingPrice
put quote & field "Property Address" & quote into propertyAddress
put line 1 of field "Property Address" into shortAddress

-- remove unwanted carriage returns
if propertyAddress contains return then
    repeat while offset(return,propertyAddress) ≠ 0
        put ", " into char offset(return,propertyAddress) of propertyAddress
    end repeat
end if

-- go to Client Stack and perform preliminary search
push card
go to stack "RE Clients"
find featureList in field "Feature List"
if the result is not empty then
    answer "No client matchups for this house."
    pop card
    exit mouseUp
end if

-- save card id of first matching card as a kind of "bookmark"
put the id of this card into firstMatch
go to next card
put false into writeFlag
open file "Client Matches" -- the external data file (text only)

-- check each matching client card for price range and client type;
-- write data into external data file
repeat forever
    find featureList in field "Feature List"

    if askingPrice ≥ field "Low Price" and -
    askingPrice ≤ field "High Price" and -
    field "Client Type" is "Buyer" then
        put field "Last Name" into matches
        put field "First Name" into item 2 of matches
        put quote & field "Address" & quote into item 3 of matches
        put field "City" into item 4 of matches
        put field "State" into item 5 of matches
        put field "ZIP" into item 6 of matches
        put propertyType into item 7 of matches
        put propertyStyle into item 8 of matches
        put propertyConstruction into item 9 of matches
        put propertyAddress & return into item 10 of matches
        write matches to file "Client Matches"

        put the short date & "letter: " & shortAddress & return -
        after field "History" -- update client contact history
        put true into writeFlag -- data successfully written to file
    end if

    -- if you've been to this card before, then exit
    if the id of this card is firstMatch then
        close file "Client Matches"
        pop card

        if not writeFlag -- no data written to the file
            then answer "No client matchups in this price range."
            else open "RE Sales Letter" with "Word 3.0" -- letter template

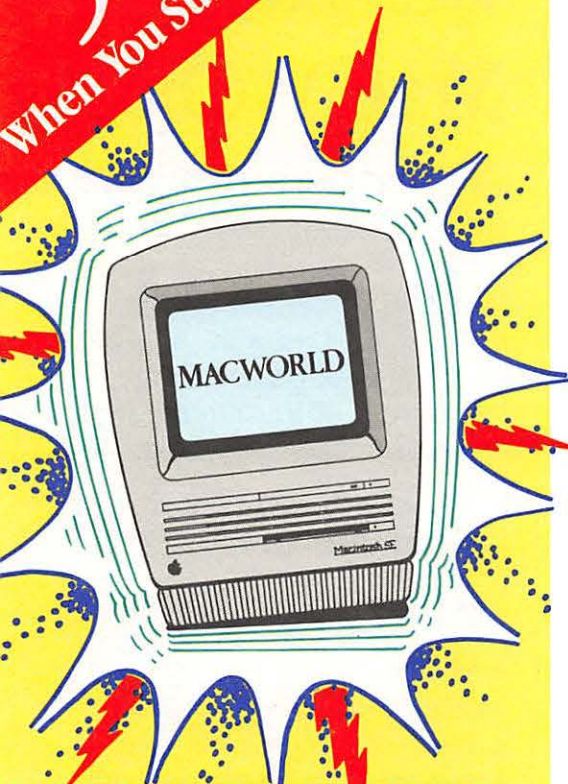
            exit mouseUp
        else go to next card

    end repeat
end mouseUp

```

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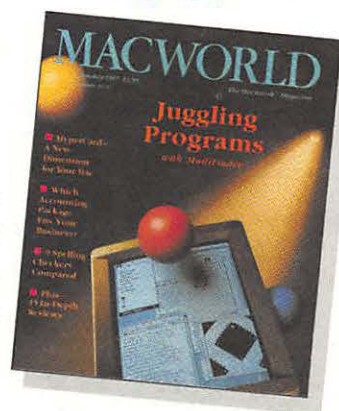
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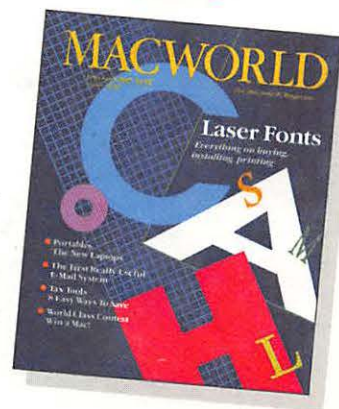
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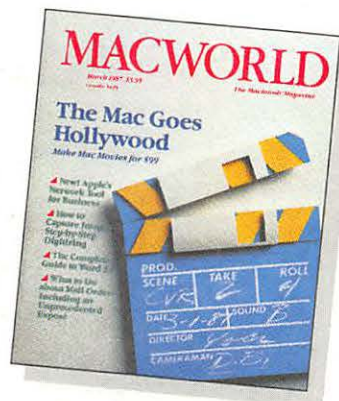
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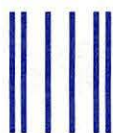
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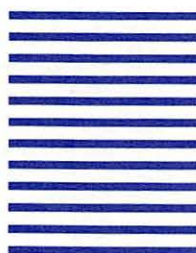
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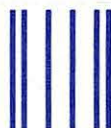
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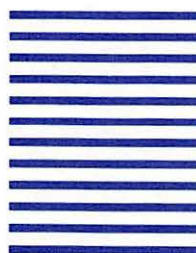
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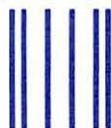
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tions match, an **if...then** construction tests whether the client is a buyer and whether the asking price fits within the buyer's price range. If so, several items from the client card and details about the property go into a list of text—separated by commas—which eventually ends up in the text file. The handler also posts the property address in the client's History field as a record of the contact.

This find-and-write loop continues until the matching card is the one singled out to be the bookmark. When the search through the entire client stack ends, the text file closes, and you return to the property stack. From there you launch into the form letter document in Word.

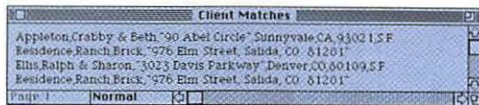
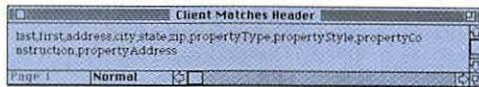
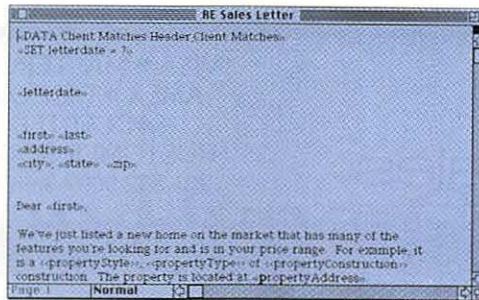
Merging in Word

Without repeating the Word manual on creating form letters, let me quickly summarize the necessary elements. First you need a letter template containing the fixed text that appears in each letter, plus placeholders within the text. You assign names to these placeholders and enclose them inside « » symbols, as in «letterdate».

The letter template begins with instruction lines that Word needs to merge a separate data file with the template, including the name of the file containing the data. In most merging situations, the first line of the data file (the header) contains the names of the placeholders in the same comma-separated order in which the actual data appears in the file—usually in lines directly below the header.

But there is another way, which lends itself better to this HyperCard-generated application: you may place the header line in its own Word file and list both the header file and the data file at the top of the template document (see "Merge Letter"). Since the HyperCard script always creates the data file with the same name, you are assured that the data file will always be on the disk ready for Word to retrieve. Fortunately, neither the header nor the data files need to be open when Word begins the merge—Word opens them for you.

Since the HyperCard script that generates the data file also launches the template document, all you have to do to print the mail-merged letters is choose Print Merge from the File menu. Word goes through the data file and assembles individual letters. In this case, the letters are personalized to



Merge Letter

Merging form letters in Microsoft Word requires a template document, a header file, and a data file. This HyperCard stack creates the data file automatically.

the addressee, and information about the address and type of property is plugged into the letter. You may also create a second template for envelopes, using only the addressee information as placeholders. Print Merge with this template, and Word prints an envelope for each customized letter.

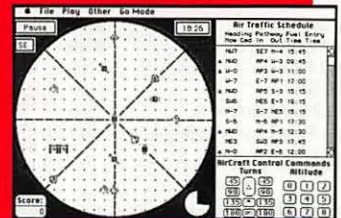
Once you understand the mechanics of searching the Client Records cards and assembling the data for customized letters from the Property Listings stack, you should be able to copy and modify the script to work in the other direction. For example, you could match existing property listings with a newly acquired house-hunting client (I've put the button in the Client Records stack, waiting for your handler). Without too much work, you can build quite an elaborate customer- and product-tracking system in this manner, while letting the Macintosh produce nearly automatic form letters to improve your communications with your clients or colleagues. □

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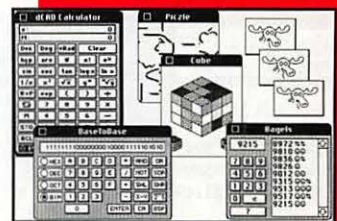
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How To/Insights

Sound Sources

Get HyperCard sounds from user groups such as BMUG (415/549-2684), BCS (617/367-8080), or Apple Corps of Dallas (214/357-9185); online information services; bulletin board services (see "Mac Communications Tools," September 1987); commercial publishers; and firms such as Educomp that distribute shareware and public domain software.

■ Commercial sounds from Acme Dot Company. HyperWare Audio Disk 1 contains 50 sounds for \$15. A free sampler, HyperSounds 2, is available online. The Acme Dot Company, P.O. Box 5923, Titusville, FL 32783. On GEnie: Shopper.

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■ I put together a Stuffit stack-pack starter kit, Musique-Concrete, available in the stack sections of GEnie, from the Desktoppers BBS in Chicago, and from BMUG. It includes ResCopy, sample scripts, Cheap-Sequencer, public domain "getcha goin'" sounds, and Chuck Maddox's SoundPlay XCMD. This command plays any SoundEdit/SoundCap files you put in the same folder as the stack.

blues: play "boing" tempo 300 "e3q b d d#". That issues the Play command, specifies which voice to play (in this case, the built-in boing), sets a tempo (300), and defines the sequence of pitches.

A four-bar phrase at the default tempo (125) takes about 9.5 seconds to play. Halving tempo doubles the play time; doubling tempo shortens it to about 4.7 seconds. Try it. Tempo has no upper limit. Above 2500 or so, long musical phrases turn into very strange, frequency-modulated burbling. Try it with the blues line, but make it repeat a dozen times to get the full effect.

You control pitch with arcane notation unique to HyperTalk (see "Noting Pitches"). In the HyperTalk notation c5s, the first character represents the note, the number indicates which octave, and the last character gives the length of the note. So in translation, c5s is a sixteenth note at C above middle C. Try boing and harpsichord at unusual pitches and short durations. If you have sampled sounds, try them at unusual pitches. Do they remind you of something else now—a lion's roar, a rocket blast?

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Insights on HyperCard

How to digitize and script sounds in HyperCard stacks

by Craig O'Donnell

Digital sounds surround us. Synthesizer tones pervade rock music, movies, and TV; these snippets of sound, called *samples*, are edited, combined, and replayed over a range of pitches. So music these days isn't exactly what it seems. Terry Fryer, of Chicago's EarWorks synthesis studio, describes some of the possibilities: "We created rhythm instruments for a jeans ad—high hats and stuff—with sampled scissors and a treadle sewing machine. We changed the pitch and timbre to get new percussion instruments."

You can do the same thing to add drama and texture to your HyperCard stacks. HyperCard comes with a few sounds that you can code into music or sound effects, but the sounds themselves can't be modified. There's a world of editable sound you can add, though, from ready-made samples to anything you sample yourself with Farallon Computing's simple-to-use MacRecorder audio digitizer. Samples can be musical (a guitar note), spoken (Bill Atkinson's digitized voice pronouncing the alphabet for his Laura's Letters stack), or chords or passages of recorded music—in fact, anything a microphone can capture.

I conducted some HyperSonic experiments and found manipulating sound in stacks to be a complex, but not difficult, process. I began with HyperCard's built-in sounds. Then I downloaded a sound stack or two and Apple engineer Steve Maller's ResCopy 4.0b1, an XCMD (external command) for moving resources including sounds from stack to stack (see "Sound Sources"). His XCMD is the most painless, reliable sound-resource tool available. With



Amanda Goodenough and her cat Inigo (pronounced Eye-KNEE-go), the star of her interactive cartoon stacks, published by the Voyager Company of Los Angeles. Goodenough's HyperCard stories produce sounds when the "reader" clicks in the right spot.

ResCopy and a few commands, I began creating sound montages. This article will help you do the same.

After a few hints on scripting sound, we'll take a look at digitizing sounds into HyperCard. But first some general guidelines. When working extensively with sounds, a SCSI hard disk helps; the Mac burps noisily if a sound file plays while a floppy is running, at least in the 1.0 version of HyperCard. MacRecorder runs best with a Mac Plus with extra RAM, though it does run with a 512K.

A-1-N-A-2... It's Scripting

HyperTalk scripts control playback pitch, duration, and rhythm. *The Complete HyperCard Handbook* (Bantam Books, 1987) devotes but four pages to sound; Dan Shafer's *HyperTalk Programming* (Hayden Books, 1988) offers nine pages. The Hyper-

Card Help stack's Play command cards explain in detail, however.

HyperCard's boing, harpsichord, and silence sounds are coded in; they cannot be moved by a resource editor. Type **play "harpsichord"** into HyperCard's message box, and the Mac responds with a tone (middle C is the default pitch).

The Play command causes sounds to play through to the end, so you don't need to specify notes or tempo to play back digitized speech (McCoy's "He's dead, Jim"), sampled music (the "Gilligan's Island" theme), or a one-shot sound effect (the "Star Trek" transporter's a hot one).

When you do take charge of the pitch, duration, and rhythm, you can create music. Try this script, which plays a bar of the

(continues)

Craig O'Donnell is a Chicago musician, MBA, and Mac aficionado who writes regularly for Electronic Musician.

Sound Sources

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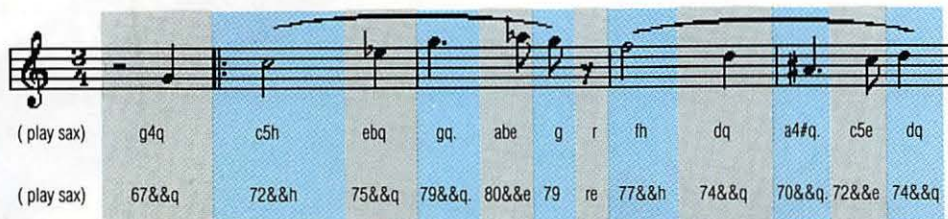
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Noting Pitches

Even if you know standard music notation, HyperTalk's equivalent may be confusing at first. Here, the first few bars of "Greensleeves" appears in standard notation and HyperTalk's two notation alternatives. The script at right repeats the whole phrase of music twice.

```
on mouseUp
  repeat for 2
    play sax g4q c5h ebq gq. abe g r
    play sax fh dq a4#q. c5e dq
    play sax eb5h ce. rs cq.
    play sax b4e c5q dh. g4q. re
  end repeat
end mouseUp
```

Continue experimenting with strings of Play commands: just copy and paste the script. As you issue the commands, HyperCard concatenates sounds as if you'd spliced bits of audio tape together—an instant sonic montage. This is real art, like that of the early electronic composers of the 1950s who tape-recorded sounds, copied and cut them, then spliced together *musique concrète* compositions.

Script a tune into a stack with the handlers On Verse/End Verse and On Chorus/End Chorus (see Listing 1). That way you don't need to include the script for the music itself every place you want it to appear.

Music or Martian?

HyperTalk's notation reads like Martian:

play "boing" tempo 120 "e c d g3h. gq d4 e cw".

Sure, and *Klaatu Varada Nikkto Yuck!*

Playing samples is simple; writing melodies is not. Luckily, the Help Stack explains notation pretty well. Still, those unfamiliar with music notation will have trouble.

You can avoid syntax attacks with Chuck Walker's free CheapSequencer stack. As you mouse on a mini-piano keyboard, the stack creates the proper HyperTalk pitch and duration arguments. You can replay and edit as you work. But replace the Delete Sequence button script with the one in Listing 2 to add a dialog box so you don't wipe out a sequence by mistake.

Between the Help Stack, CheapSequencer, and your own two ears, you'll be well on your way to music in the stack.

Open the Windows, Please

Tempo, pitch, and note value interact. Pay close attention.

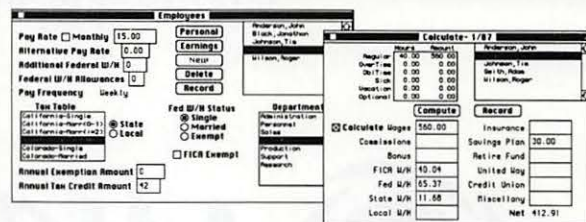
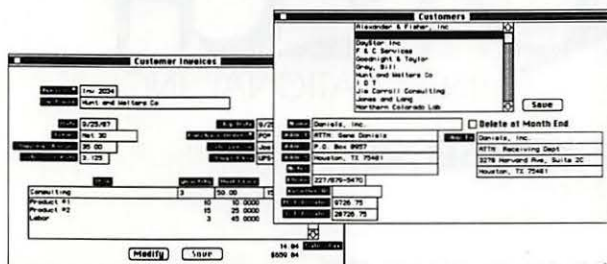
Tempo and note value set a window of a certain length within which a sound resource (SND) plays (see "A Window on Sound"). Sixteen quarter notes at tempo

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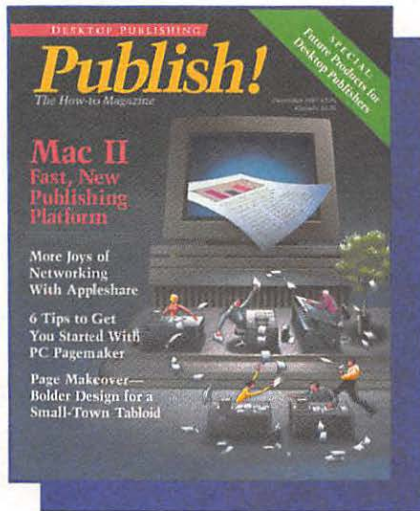
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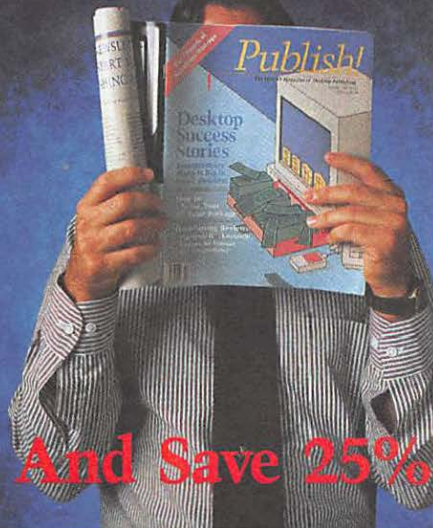
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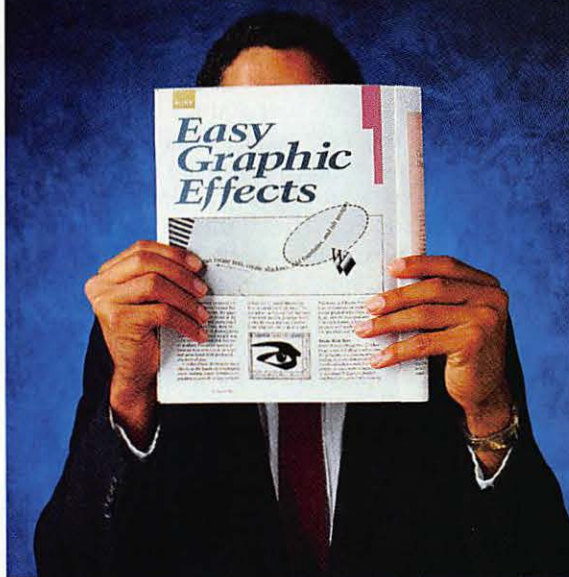
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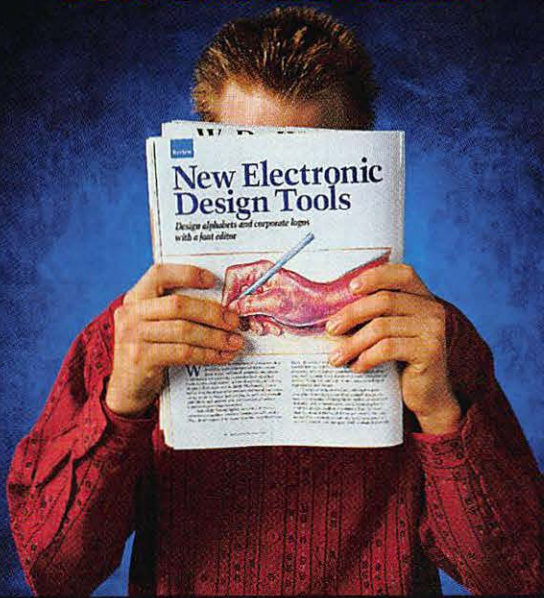
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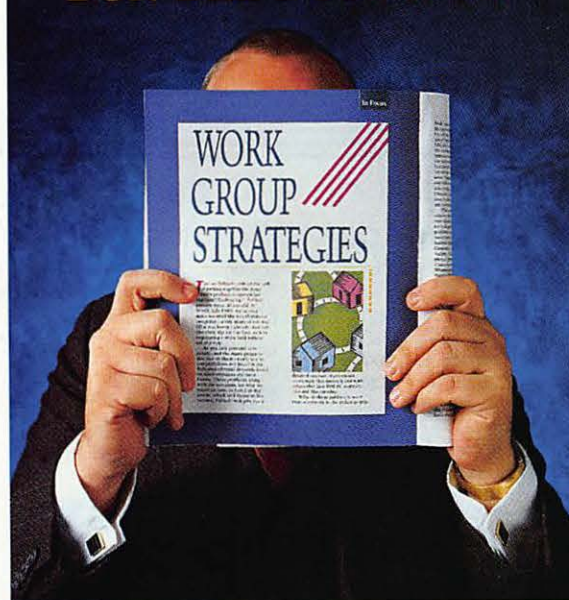
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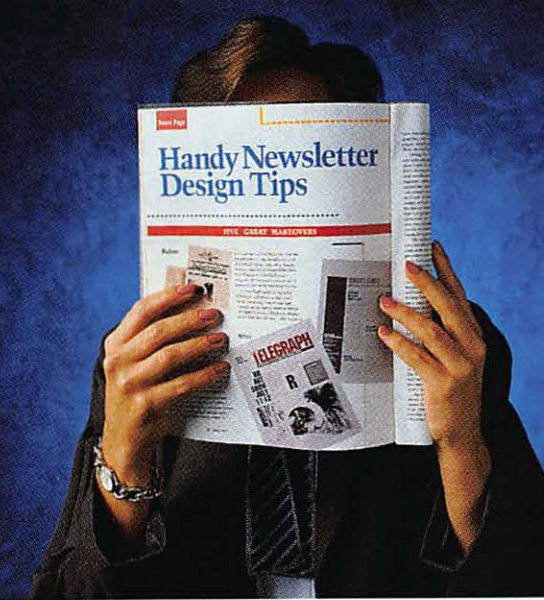
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Listings

Listing 1 demonstrates how to incorporate verses and choruses in a stack. Listing 2 is a fail-safe substitute for the script in Cheap-Sequencer's Delete Sequence button.

Listing 1

```
on mouseDown
    send Verse to stack
    send Verse to stack
    send Chorus to stack
    send Verse to stack
end mouseDown
```

Listing 2

```
on mouseUp
    answer "Delete the Sequence??" with "Yep" or "Nope"
    if it is "Yep" then
        put empty into card field Sequence1
    else exit mouseUp
end mouseUp
```

96 take about 10 seconds to play. Thus each single quarter note "owns" the Mac's speaker for about .625 second. Each eighth-note window would last .31 seconds, half the time of each quarter-note window. And so on.

Say our sample is 1 second long. At tempo 96, not all of it "fits" in a quarter-note window. But most of it plays in a dotted-quarter window, which would be .625 plus .3125 equals .9375 seconds. If our sample is 0.5 seconds long, it all plays, and silence follows until the quarter-note window has closed.

lence follows until the quarter-note window has closed.

In practical terms, at fast tempi very short notes disappear or produce a truncated *bipping*. At tempo 600 a dotted eighth note (e.) is about the shortest reliable note. Experiment with combinations of tempo and duration to get the rhythms you want. Your tune might sound very staccato if the tempo is too slow—if the windows are too long for the sounds, they'll be followed by silences, which make notes sound abrupt.

To complicate things more, sample pitch and tempo interact. Why? It's like playing a 33-rpm phonograph record at 16- or 45-rpm. Faster playback, higher pitch, shorter duration. Slower playback, lower pitch, longer elapsed time. Let's say you sample a sax playing the note c4. To get a note one octave higher, c5, just have HyperCard "play" the sample twice as fast. For c3, an octave lower? Half as fast.

A sample's tone sounds unnatural if forced beyond two and a half octaves, though: low notes last much longer than the note duration window and high notes finish too fast. The result is a little comical. So you'll want low-, middle-, and high-range saxophone samples for that Charlie Parker melody you're transcribing.

Samples from the MacRecorder

But why would you ever use sound when not making music? Sample sounds can enhance a stack's interface by giving users audio feedback. There are hundreds of noises and voices online already. You're limited only by imagination, disk space,

(continues)

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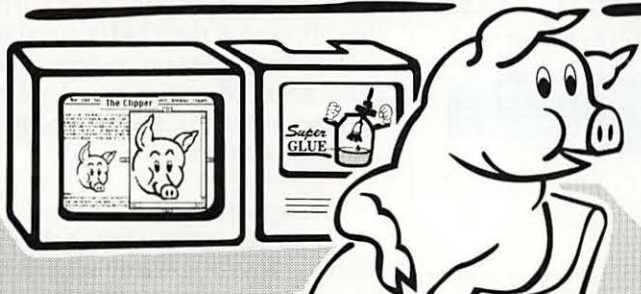
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The Three Little Pigs GET GRAPHIC



Once upon a time...

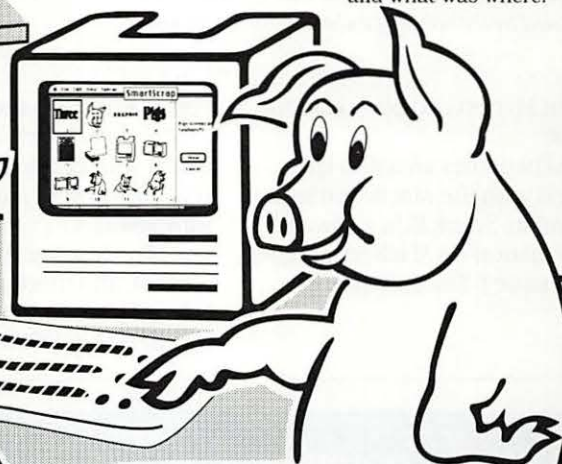
(many years after the Big Bad wolf had huffed and puffed himself out of the story), the Three Little Pigs decided to get into desktop Publishing.

The First Little Pig...

bought their business a paint program, a drawing program, a layout program, and a Great Big Hard Disk. He created so many teeny little files that he quickly lost track of what was what and what was where.

The Second Little Pig...

bought a scanner and an art program that generated PostScript files. He added all his images to the Great Big Hard Disk. After awhile, he began spending all his time trying to figure out ways to convert files from one format to another to take advantage of different programs' features.



The Third Little Pig...

(always the practical one) saw his brothers getting more and more disorganized. "Time is money," he said. "We need a software solution." So he went out and bought **SmartScrap & The Clipper™**, **The Curator™**, and **SuperGlue™** from Solutions International.



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This Ad was made entirely on a Macintosh™ using Illustrator™, PageMaker™, GraphicWorks™, SmartScrap & The Clipper™, SuperGlue™, and The Curator™. It was printed on a Linotronic 300. Trademarks - Macintosh™, Apple Computer, Illustrator™, Adobe, GraphicWorks™, Macromind.

All Three Little Pigs...

began using **SmartScrap** to create multiple scrapbooks, each with its own visual table of contents. With **The Clipper**, they were able to crop and rescale images on the clipboard with pinpoint precision. **The Curator** helped them find all the TIFF, PICT, PAINT, GLUE and EPS graphic files on the Great Big Hard Drive. What's more, because **The Curator** can easily convert images from one format to another (like EPS to PICT, or TIFF to PAINT), their format problems disappeared. They used **SuperGlue** to take finished pages from one program and treat them as if they were graphics in other programs.

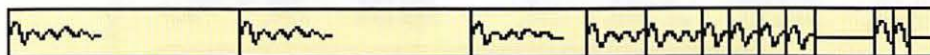
Soon, the Three Little Pigs were finishing their projects in record time. And of course, **they published happily ever after.**

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& The Clipper
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play boing tempo 96 f4w fw gh gq gq be be be be rq bs bs re

Intended music with corresponding script.



Samples playing through windows. If tempo is too slow, sample finishes before it's time for the next note.



Resulting music with unintended silences.

A Window on Sound

When HyperCard plays music, it gives the Mac speaker to each sampled sound for a length of time, or window, determined by the value of the note and the tempo.

and the fact that HyperCard plays just one sample at a time.

Hypercard becomes an audio lab when combined with the MacRecorder audio digitizer and its SoundEdit software (for more information on MacRecorder, see *Reviews* in this issue). The software con-

verts samples to the sound resource format (SND) that HyperCard uses. The Mac's internal speaker delivers AM-radio-quality reproduction of MacRecorder's mid-fidelity samples.

The MacRecorder needs software control, and there are two choices: SoundEdit is faster and more powerful; I barely touched HyperSound.

Sampling Setup

Technically, the MacRecorder is an 8-bit sampler with four sampling rates: 5 kHz, 7 kHz, 11 kHz, and 22 kHz. A *sampling rate* is simply the number of bytes-per-second used to digitally record the audio input. Compact disks are sampled at 44.1 kHz, so at best MacRecorder is half as good. That's enough for most purposes, though; even at the 22-kHz rate the Mac's speaker can't keep up, and files quickly become huge. I decided on an 11-kHz standard, resorting to 7 kHz when saving stack space is paramount.

Sampler 101

A sample is never better than its source, so the original must be as high-fidelity as possible. Digitizing a sound captures any imperfections in the sound itself, plus the imperfections of the microphone or stereo. A common pitfall: capturing background noise. For example, use an external mike to get a good distance from the SE's fan.

(continues)

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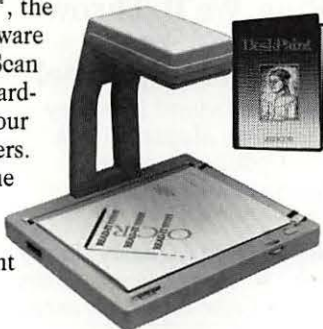
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How To/Insights

MacRecorder's built-in condenser mike is barely good enough for quick-and-dirty sampling, so I wanted an external microphone anyway. Off to Radio Shack. The small Ultra-Thin Omni Mic (#33-1089, \$14.95) turned out to be my workaday unit. Its flat profile delivers better sound than a typical cheapo. Through a Mac speaker, its samples came close to my first-choice mike: Realistic's PZM Microphone (#33-1090, \$44.95; get the 274-047B 1/4-inch female-to-miniature-male adapter, \$1.39). Pressure-Zone microphones (PZMs) are goof-proof and have superior clarity (even professional studios have a few Realistic PZMs hanging around). The budget Omni uses a variant of the Pressure-Zone design.

These pressure-sensitive mikes are best for amateur recordists because they eliminate comb-filtering effects caused by poor mike placement (when the MacRecorder is sitting on a table, its internal mike produces severe comb-filtering). These effects become part of the sample and reduce its fidelity—and you can't edit them away. A foolproof microphone allows clean-sounding samples.

For ultimate quality, pretend the MacRecorder is a cassette deck and record into its line input over a cable from a stereo, cassette deck, or VCR. Farallon provides an audio Y-cable, but I prefer a one-wire monaural feed (Radio Shack #42-2444, a 6-foot phono-plug-to-miniature-phone-plug cable, \$1.99). For source material, a compact disk (CD) is best; a good clean record is next; then a cassette; then a hi-fi video deck.

Since MacRecorder may take a few seconds to get going after you click the microphone icon, begin playing the sound you want to record *after* the MacRecorder progress indicator shows it's begun to work. SoundEdit lets you cut and paste sound wave sections, so don't worry about getting too much. That's better than not getting enough—the very beginning of the sound, the *attack*, is extremely important.

MacRecorder and SoundEdit are your ticket to the samplin' fools' club. It's impossible to cover the world of sound sampling in this short space, so just plunge in with one eye on my hints, and the other on the VU meters. Don't forget to post your sounds online for everyone to hear. □

See *Where to Buy* for contact information.

Updates

This list brings you the highlights of software recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

C.A.T. version 2.0 adds export capabilities and lets you share files in C.A.T. workgroups. Features automatic phone dialing and other user-requested enhancements. Includes a new manual. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129-1088, 408/246-8020. \$50; \$399.95 new.

1stAid version 2.2 expands its diagnostic capabilities. It has the capacity to recover the data from "In Use" sectors; improves Undelete and Salvage All Files functions, including restoring many files with names and icons. Utilizes disk space more efficiently during file recovery, and performs recovery operation on folders. Improvements have been made in report formatting, printing, user interface, and speed. The Troubleshooting Guide has been revised with an expanded error message list and additional troubleshooting procedures, with special procedures for hard disks. Additions have been made to the lists of Creator and Type codes. 1stAid Software, 42 Radnor Rd., Boston, MA 02135, 617/783-7118. \$29.95; \$99.95 new.

4th Dimension version 1.0.4 introduces a new index structure for International characters. It fixes SANE rounding errors, memory-management problems, and other bugs. Acius, 20300 Stevens Creek

Bld., #495, Cupertino, CA 95014, 408/252-4444. Free; \$695 new.

Hard Disk Partition version 2.0 adds the ability to partition any drive. It enhances the user interface and extends performance when accessing partitions. The partition sizing has been revamped to allow for better contiguous allocation. Fully compatible with the current system. Includes revised documentation. FWB, Inc., Attn: HDP 2.0 Update, 2040 Polk St., #215, San Francisco, CA 94109, 415/474-8055. \$20; \$69.95 new.

MacImage version 2.0 features high-quality image capture, extensive previewing facilities, detailed image manipulation and processing, and the ability to save gray-scale images in any of 13 formats. It provides up to 256 levels of gray-scale information at 4 to 8 bits per pixel, at resolutions from 150 to 400 dpi. Datacopy Corp., 1215 Terra Bella Ave., Mountain View, CA 94043, 415/965-7900. Free if originally purchased after September 4, 1987, otherwise \$50; \$495 new.

MacMoney version 3.01 includes credit card reconciliation, a running balance report, and weekly automatic transactions. The new version adds a Preference Options menu and allows users to select a sort sequence for the check register. Improves check printing, and allows selective font styling on reports. Survivor Software Ltd., 11222 La Cienega Blvd., #450, Inglewood, CA 90304, 213/410-9527. Free if originally purchased after August 1, 1987, otherwise \$25; \$119 new.

Micro Planner version 6.0 has multi-user capabilities. Micro Planning International, 235 Montgomery St., #840, San Francisco, CA 94104, 415/788-3324. \$100; \$595 new.

Quarterstaff version 1.2e fixes bugs. It has an improved parser and now includes hierarchical menus. Simulated Environment Systems, 800 S. Pacific Coast Hwy., Suite 8-331, Redondo Beach, CA 90277, 213/379-6742. Free with return of original disk, otherwise \$5; \$49.95 new.

Rascal version 3 is fully Mac II-compatible. It supports color and HyperCard extensions. The libraries have been overhauled, and the utilities have been rewritten and enhanced. The compiler and linker are faster, and this version includes segmentation for programs whose object files exceed 32K. Enhanced auto-menu capability. Includes new primer, manual, and language documentation. Metaresearch Inc., 1211 S.W. Fifth, #2860, Portland, OR 97204, 503/228-5806. Double-sided disk package \$59, single-sided disk package \$61; \$149 new.

Stella version 2.0 has full Cut, Copy, Paste, and data import/export capabilities. High Performance Systems, 13 Dartmouth College Hwy., Lyme, NH 03768, 603/795-4857. Standard \$32.50, Mac II \$77.50; standard \$350 new, Mac II (requires 68020 CPU and 68881 math coprocessor) \$425 new. □

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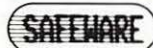
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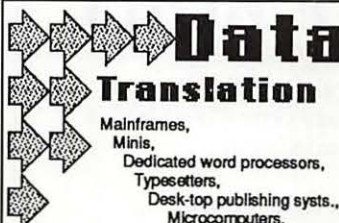


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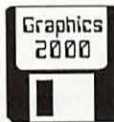
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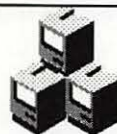
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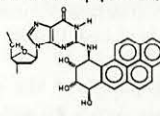
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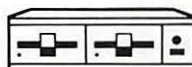
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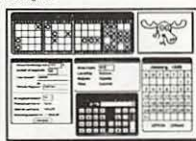


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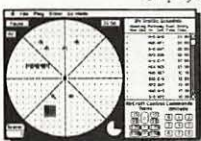


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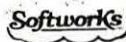
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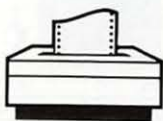
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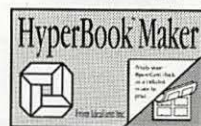
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Circle 138 on reader service card

Where to Buy

This listing provides company addresses and phone numbers for products mentioned in this issue. Allow several weeks for responses to Reader Service Card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

Reader
Service

- A**
- 701 **AffiniFile.** Affinity Microsystems Ltd., 1050 Walnut St., #425, Boulder, CO 80302, 303/442-4840, 800/367-6771.
- 702 **American Discovery.** Great Wave Software, Inc., 5353 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-1990.
- 703 **Apache Strike.** Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956.
- 704 **Apple Tape Backup 40SC.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- B**
- 705 **Business Filevision.** Marvelin Corp., 3420 Ocean Park Blvd., #3020, Santa Monica, CA 90405, 213/450-6813.
- 706 **Business LaserPrinter.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- C**
- 707 **Capture.** Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301, 818/991-6540.
- 708 **CG400 PS.** Compugraphic Corp., 200 Ballardvale St., Wilmington, MA 01887, 617/658-5600.
- 709 **Colorizer.** Palomar Software, Inc., P.O. Box 120, Oceanside, CA 92054, 619/721-7000.
- 710 **Curator.** Solutions International, Inc., 29 Main St., Montpelier, VT 05602, 802/229-0368.
- D**
- 711 **Data File 40.** Giga Cell Systems/NuData Inc., 4201 Burton Dr., Santa Clara, CA 95054, 408/727-1049, 800/832-8268.
- 712 **Dataproducts LZR-1260.** Dataproducts Corp., 6200 Canoga Ave., Woodland Hills, CA 91365, 818/887-8000.
- 713 **Dataproducts LZR-2665.** Dataproducts Corp., 6200 Canoga Ave., Woodland Hills, CA 91365, 818/887-8000.
- * **dBase Mac.** Ashton-Tate Corp., 20101 Hamilton Ave., Torrance, CA 90502-1319, 213/329-8000.
- 714 **DTP Advisor.** HyperSoft, P.O. Box 566, San Francisco, CA 94101, 415/558-9161.
- E**
- 715 **Excellent Exchange.** Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA 94523, 415/943-7667, 800/225-6755.
- 716 **Excellerate.** Personal Training Systems, P.O. Box 54240, San Jose, CA 95154, 408/559-8635.
- 717 **ExcelTrain.** SofTrain, Inc., Rt. 2, Box 56R, Cedar Creek, TX 78612, 512/321-1000.
- 718 **Excel Tutorials.** Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA 94523, 415/943-7667, 800/225-6755.
- F**
- 719 **Fast Forms.** Shana Enterprises Inc., Advanced Technology Center, 9650 20th Ave., Edmonton, Alberta, Canada T6N 1G1, 403/438-6548.
- 720 **FileMaker Plus.** Nashoba Systems, Inc., 1157 Triton Dr., Ste. A, Foster City, CA 94404, 415/578-1970, 800/274-0610.
- 721 **1stFile.** 1stDesk Systems, Inc., 7 Industrial Park Rd., Medway, MA 02053, 617/533-2203, 800/522-2286.
- 722 **1stTeam.** 1stDesk Systems, Inc., 7 Industrial Park Rd., Medway, MA 02053, 617/533-2203, 800/522-2286.
- 723 **4th Dimension.** Acius, Inc., 20300 Stevens Creek Blvd., #495, Cupertino, CA 95014, 408/252-4444, 800/538-8157.
- 724 **4DTrain.** SofTrain, Inc., Rt. 2, Box 56R, Cedar Creek, TX 78612, 512/321-1000.
- G**
- 725 **General Computer HyperTape.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- H**
- 726 **Hayes InterBridge.** Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617.
- 727 **How to Operate the Macintosh.** FlipTrack Learning Systems, 999 Main, #200, Glen Ellyn, IL 60137, 312/760-1117, 800/222-3547.
- 728 **How to Use Microsoft Word.** FlipTrack Learning Systems, 999 Main, #200, Glen Ellyn, IL 60137, 312/760-1117, 800/222-3547.
- 729 **How to Use PageMaker 3.0.** FlipTrack Learning Systems, 999 Main, #200, Glen Ellyn, IL 60137, 312/760-1117, 800/222-3547.
- 730 **HyperCard.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 731 **HyperCard Tutorials.** Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA 94523, 415/943-7667, 800/225-6755.
- 732 **HyperEasy.** Personal Training Systems, P.O. Box 54240, San Jose, CA 95154, 408/559-8635.
- 733 **HyperTrain.** SofTrain, Inc., Rt. 2, Box 56R, Cedar Creek, TX 78612, 512/321-1000.

Where to Buy

Reader
Service

- 734 **Import/Export.** Marvelin Corp., 3420 Ocean Park Blvd., #3020, Santa Monica, CA 90405, 213/450-6813.
- 735 **Introduction to Design for DTP.** FlipTrack Learning Systems, 999 Main, #200, Glen Ellyn, IL 60137, 312/760-1117, 800/222-3547.
- 736 **Kiwi Envelopes.** Kiwi Software, Inc., 6546 Pardall Rd., Santa Barbara, CA 93117, 805/685-4031.
- 737 **LaserFeeder.** BDT Products, Inc., 17152 Armstrong Ave., Irvine, CA 92714, 714/660-1386, 800/346-3238.
- 738 **LaserServer.** DataSpace Corp., 185 Riviera Dr., Unit 9, Markham, Ontario, Canada L3R 5J6, 416/474-0113, 800/387-0492.
- 739 **LaserStation.** BDT Products, Inc., 17152 Armstrong Ave., Irvine, CA 92714, 714/660-1386, 800/346-3238.
- 740 **LaserWriter Plus.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 741 **LaserWriter IINT.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 742 **LaserWriter IINTX.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 743 **LaserWriter IISC.** Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010.
- 744 **LearnMore.** Personal Training Systems, P.O. Box 54240, San Jose, CA, 95154, 408/559-8635.
- 745 **LearnWord.** Personal Training Systems, P.O. Box 54240, San Jose, CA, 95154, 408/559-8635.
- 746 **Liaison.** Infosphere, Inc., 4730 S.W. Macadam Ave., Portland, OR 97201, 503/226-3620, 800/445-7085.
- 747 **LPA MacPROLOG 2.0 Wizard Edition.** Logic Programming Associates Ltd., Studio 4, Royal Victoria Patriotic Bldg., Trinity Rd., London SW18 3SX, England, 01 871 2016.
- 748 **MacRat.** Solana Electronics, 7887 Dunbrook Rd., Ste. A, San Diego, CA 92126, 619/566-1701.
- 749 **MacRecorder Sound Digitizer.** Farallon Computing, 2150 Kittredge St., Berkeley, CA 95709, 415/849-2331.
- 750 **MacTeX.** FTL Systems, Inc., 234 Eglinton Ave. E, #205, Toronto, Ontario, Canada M4P 1K5, 416/487-2142.
- 751 **MacTree.** Software Research Technologies, 22901 Mill Creek Dr., Ste. B, Laguna Hills, CA 92653, 714/472-0474, 800/824-5537.
- 752 **MacType.** Palantir Software, 12777 Jones Rd., #100, Houston, TX 77070, 713/955-8880, 800/368-3797.
- 753 **MasterWorks.** Personal Training Systems, P.O. Box 54240, San Jose, CA 95154, 408/559-8635.
- 754 **MergeWrite.** Software Discoveries, Inc., 137 Krawski Dr., South Windsor, CT 06074, 203/872-1024, 800/437-5200.
- * **Microsoft Chart.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- * **Microsoft File.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- * **Microsoft Mail.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- * **Microsoft Word.** Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400.
- 755 **ModernJazz.** Lotus Development Corp., 55 Cambridge Pkwy., Cambridge, MA 02142, 617/577-8500.
- 756 **MultiFeeder.** BDT Products, Inc., 17152 Armstrong Ave., Irvine, CA 92714, 714/660-1386, 800/346-3238.
- 757 **MultiLedger.** CheckMark Software, Inc., P.O. Box 860, Fort Collins, CO 80522, 303/484-3541.
- 758 **NEC SilentWriter LC890.** NEC Information Systems, Inc., 1414 Massachusetts Ave., Boxborough, MA 01719, 617/264-8000.
- 759 **NetModem v1200.** Shiva Corp., 222 Third St., #1200, Cambridge, MA 02142, 617/661-2026, 800/458-3550.
- 760 **NetModem v2400.** Shiva Corp., 222 Third St., #1200, Cambridge, MA 02142, 617/661-2026, 800/458-3550.
- 761 **NetSerial X232.** Shiva Corp., 222 Third St., #1200, Cambridge, MA 02142, 617/661-2026, 800/458-3550.
- 762 **Notes...for Excel.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 763 **Notes...for Jazz.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 764 **Notes...for PageMaker.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 765 **Notes...for ReadySetGo 4.0.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 766 **Notes...for Word 3.0.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 767 **Notes...for Works.** Layered, Inc., 529 Main St., Boston, MA 02129, 617/242-7700.
- 768 **OmniLaser 2106.** Texas Instruments, Inc., P.O. Box 809063, Dallas, TX 75380-9063, 800/232-3200.
- 769 **OmniLaser 2108.** Texas Instruments, Inc., P.O. Box 809063, Dallas, TX 75380-9063, 800/232-3200.
- 770 **OmniLaser 2115.** Texas Instruments, Inc., P.O. Box 809063, Dallas, TX 75380-9063, 800/232-3200.
- 771 **OverVue.** ProVue Development Corp., 222 22nd St., Huntington Beach, CA 92648, 714/969-2431.
- 772 **PageMaker Live.** Image Express, P.O. Box 2913, El Modena, CA 92669, 714/938-1070.
- 773 **PageOne.** McCutcheon Graphics, Inc., 500 Cochrane Dr., Unit A, Markham, Ontario, Canada L3R 8E2, 416/479-9292.
- 774 **PageTutor.** Personal Training Systems, P.O. Box 54240, San Jose, CA 95154, 408/559-8635.
- 775 **Paper Plus 500.** The Laser Connection, Inc., 7852 Schillinger Park W, Mobile, AL 36608, 205/633-7223, 800/523-2696.
- 776 **Paper Plus 1000.** The Laser Connection, Inc., 7852 Schillinger Park W, Mobile, AL 36608, 205/633-7223, 800/523-2696.
- 777 **PCRat.** Solana Electronics, 7887 Dunbrook Rd., Ste. A, San Diego, CA 92126, 619/566-1701.

- 778 **Personal LaserPrinter.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- 779 **Personal LaserPrinter Plus.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- 780 **PictureBase.** Symmetry Corp., 761 E. University Dr., Ste. C, Mesa, AZ 85203, 602/844-2199, 800/624-2485.
- 781 **PLP Share.** General Computer Corp., 580 Winter St., Waltham, MA 02154, 617/890-0880, 800/634-9737.
- 782 **Professional 2400.** Novation, Inc., 21345 Lassen Ave., Chatsworth, CA 91311, 818/998-5060.
- 783 **PS Jet+.** The Laser Connection, Inc., 7852 Schillinger Park W, Mobile, AL 36608, 205/633-7223, 800/523-2696.
- Q**
- 784 **QMS-PS 800.** QMS, Inc., P.O. Box 81250, Mobile, AL 36689, 205/633-4300.
- 785 **QMS-PS 800+.** QMS, Inc., P.O. Box 81250, Mobile, AL 36689, 205/633-4300.
- 786 **QMS-PS 800 II.** QMS, Inc., P.O. Box 81250, Mobile, AL 36689, 205/633-4300.
- 787 **QMS-PS 810.** QMS, Inc., P.O. Box 81250, Mobile, AL 36689, 205/633-4300.
- 788 **QMS-PS 2400.** QMS, Inc., P.O. Box 81250, Mobile, AL 36689, 205/633-4300.
- R**
- 789 **R-Server.** Solana Electronics, 7887 Dunbrook Rd., Ste. A, San Diego, CA 92126, 619/566-1701.
- 790 **RecordHolder Plus.** Software Discoveries, Inc., 137 Krawski Dr., South Windsor, CT 06074, 203/872-1024, 800/437-5200.
- 791 **Reflex Plus.** Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400, 800/255-8008.
- S**
- 792 **ScriptTEN.** QUME Corp., 500 Yosemite Dr., Milpitas, CA 90035, 408/942-4000.
- 793 **SilverServer.** La Cie, 16285 S.W. 85th, #306, Tigard, OR 97224, 503/684-0143.
- 794 **SmartModem 2400.** Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617.
- T**
- 795 **Teach Yourself 4th Dimension.** Tutorland Corp., 175 Calvert Dr., Ste. R204, Cupertino, CA 95014, 408/973-0472.
- 796 **Teach Yourself Excel.** Tutorland Corp., 175 Calvert Dr., Ste. R204, Cupertino, CA 95014, 408/973-0472.
- 797 **Teach Yourself PageMaker 2.0.** Tutorland Corp., 175 Calvert Dr., Ste. R204, Cupertino, CA 95014, 408/973-0472.

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- 798 **TeleNode.** DataSpace Corp., 185 Riviera Dr., Unit 9, Markham, Ontario, Canada L3R 5J6, 416/474-0113, 800/387-0492.
- 799 **Think 'n Time.** Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301, 818/991-6540.
- 800 **TrailBlazer Plus.** Telebit Corp., 1345 Shorebird Way, Mountain View, CA 94043-1329, 408/996-8000, 800/835-3248.
- 801 **TrueForm Set-Up.** Spectrum Digital Systems, Inc., 2702 International Ln., #112, Madison, WI 53704, 608/244-4300, 800/541-6661.
- 802 **TrueForm Fill-Out.** Spectrum Digital Systems, Inc., 2702 International Ln., #112, Madison, WI 53704, 608/244-4300, 800/541-6661.
- 803 **Trust and Betrayal: The Legacy of Siboot.** Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667, 800/221-9884.
- 804 **Turbo Pascal Tutor for the Macintosh.** Borland International, 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400, 800/255-8008.
- 805 **TurboLaser/PS.** AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992, 714/553-0340.
- 806 **Typing Instructor Encore.** Individual Software, Inc., 125 Shoreway Rd., #3000, San Carlos, CA 94070, 415/595-8855, 800/331-3313.
- 807 **Typing Made Easy.** QED Information Sciences, Inc., QED Plaza, P.O. Box 18, Wellesley, MA 02181, 800/343-4848.
- U**
- 808 **Understanding PageMaker.** Techware, Inc., P.O. Box 1085, Altamonte Springs, FL 32715, 305/834-3431.
- V**
- 809 **Varityper VT600.** Varityper, 11 Mt. Pleasant Ave., East Hanover, NJ 94545, 201/887-8000.
- 810 **VideoTutor Presents PageMaker.** Computer Training Resources, Inc., 219 Illihau St., Kailua, HI 96734, 808/254-6419.
- W**
- 811 **Word Tutorials.** Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA 94523, 415/943-7667, 800/225-6755.
- 812 **WordTrain Mac.** SofTrain, Inc., Rt. 2, Box 56R, Cedar Creek, TX 78612, 512/321-1000.
- 813 **Works Tutorials.** Heizer Software, 1941 Oak Park Blvd., #30, Pleasant Hill, CA, 94523, 415/943-7667, 800/225-6755.
- 814 **WorksPlus Command.** Lundeen & Associates, P.O. Box 30038, Oakland, CA 94604, 415/893-7587, 800/233-6851.
- 815 **WorksTrain Mac.** SofTrain, Inc., Rt. 2, Box 56R, Cedar Creek, TX 78612, 512/321-1000. □

Public Domain/Shareware Available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as Budgetbytes (800/536-3551 for orders, 913/271-6022 in Kansas), Educomp (800/843-9497, 619/259-0255 in California), or the Public Domain Exchange (800/331-8125, 408/496-0624 in California).

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*Till July 15, 1988.

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Macworld Best-Sellers

Months on chart	Last month	This month	
			Business Software
16	1	1	Microsoft Works <i>Microsoft</i>
36	3	2	Microsoft Word <i>Microsoft</i>
28	2	3	Microsoft Excel <i>Microsoft</i>
24	4	4	PageMaker <i>Aldus</i>
2	—	5	MacInTax <i>SoftView</i>
2	—	6	Word Finder <i>Microlytics</i>
14	6	7	SuperPaint <i>Silicon Beach Software</i>
8	—	8	MacMoney <i>Survivor Software</i>
4	7	9	Cricket Draw <i>Cricket Software</i>
1	—	10	Canvas <i>Deneba Software</i>

			Education Software
20	1	1	Math Blaster <i>Davidson & Associates</i>
20	3	2	KidsTime <i>Great Wave Software</i>
9	—	3	Early Games <i>Springboard Software</i>
18	2	4	Typing Tutor III <i>Simon & Schuster Computer Software</i>
4	4	5	Reader Rabbit <i>The Learning Company</i>

			Entertainment Software
16	1	1	Dark Castle <i>Silicon Beach Software</i>
20	2	2	MacGolf <i>Practical Computer Applications</i>
20	3	3	Flight Simulator <i>Microsoft</i>
2	4	4	Falcon <i>Spectrum Holobyte</i>
4	—	5	Hardball <i>Accolade</i>

			Networking/Data Communications
16	1	1	TOPS <i>TOPS</i>
20	2	2	AppleTalk <i>Apple Computer</i>
12	3	3	AppleShare <i>Apple Computer</i>
4	4	4	PhoneNet <i>Farallon Computing</i>
19	5	5	MacServe <i>Infosphere</i>

Months on chart	Last month	This month	
			Hard Disks*
16	1	1	Apple Hard Disk 20/20SC <i>Apple Computer</i>
9	2	2	Macintosh Internal 20SC Hard Disk <i>Apple Computer</i>
9	3	3	Rodime 20 Plus <i>Rodime</i>
1	—	4	DataFrame XP 30 <i>SuperMac Technology</i>
3	5	5	MacStack 20 <i>CMS Enhancements</i>

			Add-in Boards
7	3	1	Apple 1MB Memory Expansion Kit <i>Apple Computer</i>
7	1	2	Apple 2MB Memory Expansion Kit <i>Apple Computer</i>
7	2	3	Radius Accelerator <i>Radius</i>
4	4	4	Video Board/Large Screen <i>Ryad</i>
3	—	5	Macintosh II Video Card <i>Apple Computer</i>

Product Watch

Editors' choice:

Other recent or forthcoming products of particular interest.

Quicken *Intuit* single-entry financial management program

Reports *Activision* report generator for HyperCard stacks

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order suppliers. Covers sales during February 1988.

*Does not include hard disks installed at the factory.

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MacTimes

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John Dvorak,
San Francisco Examiner

“Right now, WriteNow comes the closest to delivering on the promise of future word processing.”

Michael Miller,
InfoWorld

“This is the word processor that we designed and built Macintosh for.”

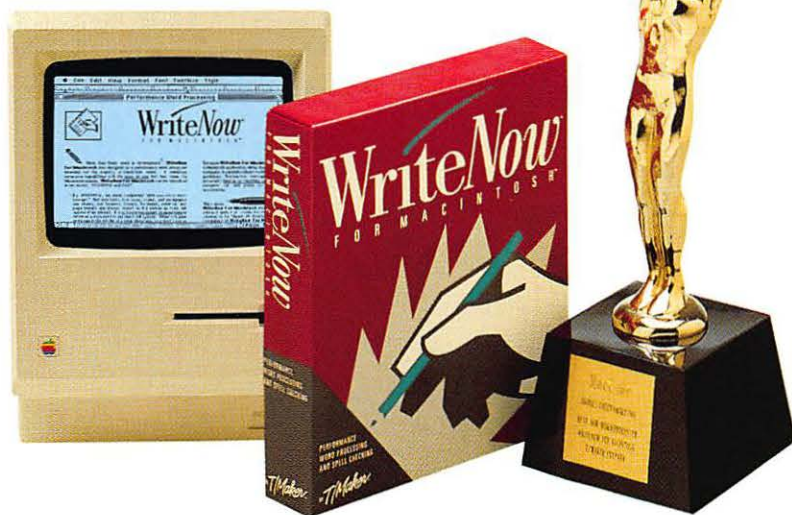
Steve Jobs,
NeXT Inc.

“T/Maker's WriteNow For Macintosh is a polished word processor that retains the elegance of MacWrite but adds features like multiple windows, footnotes, multiple columns, and a spell checker.”

Dan Farber,
MacWorld Magazine

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Vicky Jo Varner,
The MACazine



Best New Word Processor
MacUser Magazine 1986

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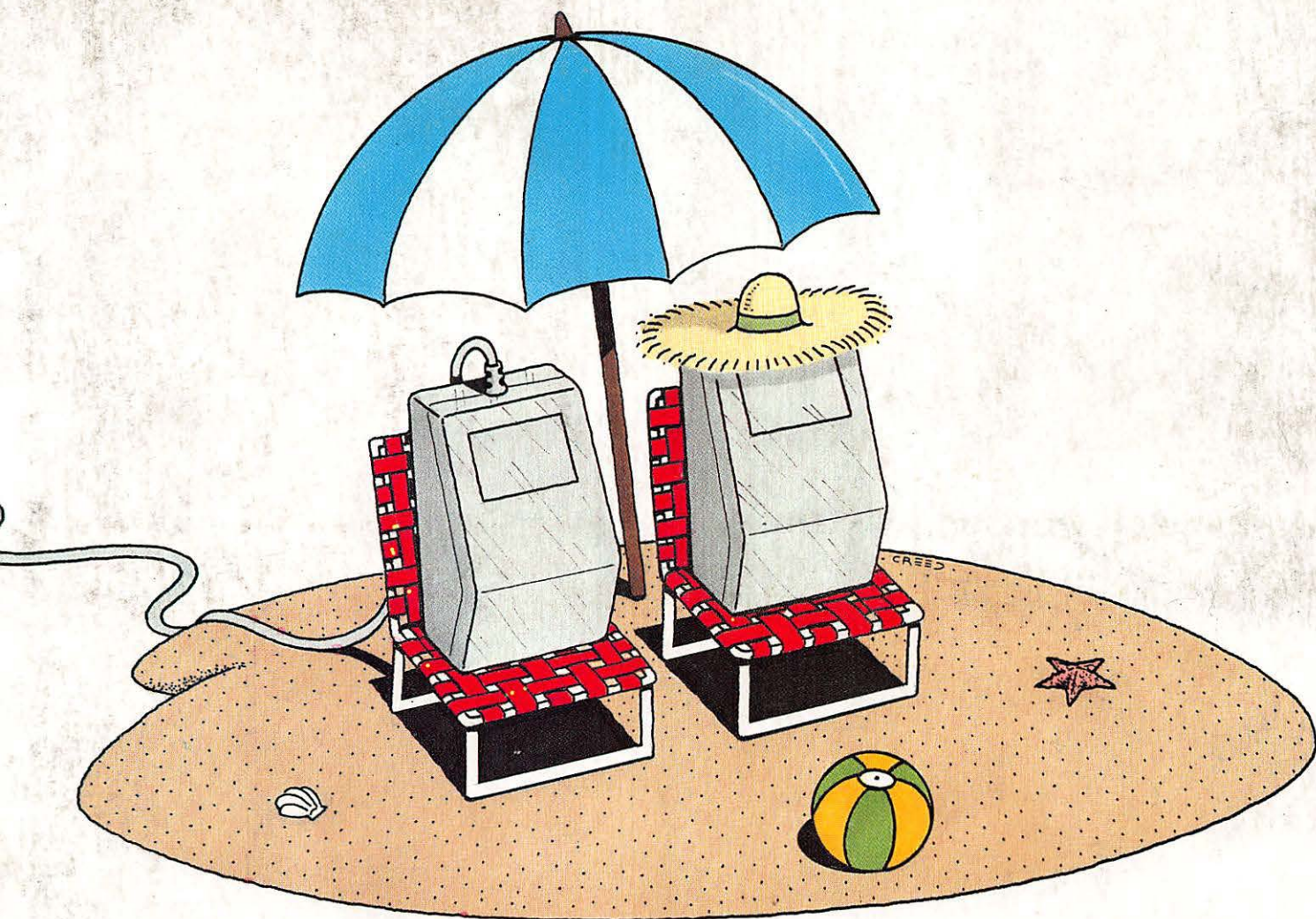
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